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Desert Harvest Solar Project

Final Environmental Impact Statement
and
Proposed California Desert Conservation Area Plan Amendment

Volume 4 - Appendices C.9 through G

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Cover Photo: View of the solar facility site from Kaiser Road

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Appendix C.9

Draft Bird and Bat Conservation Strategy

Draft Bird and Bat Conservation Strategy
Desert Harvest Solar Project

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January 2012

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ABBREVIATIONS AND ACRONYMS

Alternating current	AC
Bald and Golden Eagle Protection Act	BGEPA
Bird and Bat Conservation Strategy	BBCS
Bureau of Land Management	BLM
California Burrowing Owl Consortium	CBOC
California Environmental Quality Act	CEQA
Desert Harvest Solar Project	DHSP
Desert Wildlife Management Area	DWMA
Direct current	DC
Draft Environmental Impact Statement	DEIS
Engineering, procurement and construction	EPC
Federal Endangered Species Act	ESA
Gallons per day	GPD
Generator tie line	gen-tie line
Kilowatt	kW
Megawatt	MW
Migratory Bird Treaty Act	MBTA
National Environmental Policy Act	NEPA
Natural Community Conservation Planning Act	NCCP
Operation and maintenance	O&M
Photovoltaic	PV
Record of Decision	ROD
Right-of-way	ROW
Total dissolved solids	TDS
US Fish and Wildlife Service	USFWS
Wildlife Management Habitat Area	WHMA

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California. The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a). enXco is voluntarily proposing this Bird and Bat Conservation Strategy to set forth the measures it will implement to avoid, minimize, or mitigate for potential adverse effects of the Project to birds or bats. Accordingly, enXco will collect and evaluate data during the construction, operation and maintenance (O&M), and decommissioning phases of the Project and will implement adaptive management measures as necessary and appropriate to minimize or mitigate impacts to birds or bats. enXco does not anticipate that construction, operations, or decommissioning of the project will cause unauthorized take or prohibited disturbance of bird or bat species.

This Bird and Bat Conservation Strategy (BBCS) was prepared according to guidelines recommended by the US Fish and Wildlife Service (USFWS 2010a; 2010b). It describes the proposed DHSP Project components, summarizes baseline data regarding birds and bats in the Project vicinity; assesses potential risks to those species that could result from Project construction, operation, and decommissioning; and describes conservation measures to be implemented, to minimize those risks.

1.1 PROJECT DESCRIPTION

The DHSP would be located on BLM-administered land north of Desert Center in Riverside County (Figures 1 and 2). Several designated wildlife management areas are in the vicinity of the applicant's right-of-way (ROW; Figure 3). Portions of the proposed and alternative generator transmission lines (gen-tie lines) are within a designated Desert Wildlife Management Area (DWMA) and critical habitat (both designated for desert tortoise). The project's Draft Environmental Impact Statement (DEIS) analyzes 3 solar project alternatives and 4 gen-tie line alternatives. This section of the BBCS summarizes the applicant's proposed project and the alternatives. More complete descriptions of the Project and alternatives may be found in Chapter 2 of the DEIS.

1.1.1 Structures and Facilities

Solar field. The DHSP would be a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. The proposed project site is comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres. The proposed solar facility would consist of several main components. Table 1 presents a breakdown of site acreage for each solar facility component.

- Main generation area—PV arrays, switchyard, inverters, overhead lines, and access corridors;
- Operations and maintenance (O&M) Facility – either on or off site;
- On-site electrical substation; and
- Site security, fencing, and lighting.

Table 1. Estimated Overall Project Acreage

Project Component	Acreage
Current BLM right-of-way case record (Northern Parcel / Southern Parcel; respectively)	1,208 (1,053 / 155)
Solar panel field	1,200
Area cleared of vegetation (10% of Project area)	107
Parking and admin areas	3.0
Access corridors	200
Construction laydown area	2
Gravel access roads	10
On-site substation	3
Area disturbed by trenching	11
Area permanently covered by at-grade items (footprint of piles, power conversion station, transformer, PV combining switchgear, on-site substation, on-site overhead line poles, Visitors Center, M&M Facility)	10
Water storage ponds	2
Approximate maximum area shaded by PV modules	910

The specific PV technology to be installed has not been determined. The project may use any of a variety of PV technologies, including, but not limited to:

- Crystalline silicon panels
- Copper indium gallium cyanide selenide panels
- Fixed-tilt racking system
- Single-axis tracking system

The PV modules would be organized into arrays that would be spread out over approximately 1,200 acres of the site. Each megawatt requires approximately 8 acres. Each array would consist of PV modules, a power conversion station, and a transformer. Tracking systems, which may be installed, have motors that rotate the PV modules from east to west during the day to track the sun across the sky.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a “disc and roll” technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level, as well as “micrograding” or “isolated cut and fill and roll” of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 910 acres of the solar facility acreage.

The field of panels would consist of repeating blocks of 1.44 MW (AC). The approximate dimensions of each array block would consist of 12,480 panels, separated into four quadrants (northwest, southwest, northeast, southeast). Within each quadrant, there would be 6 rows of 10 or 11 48-panel strings, arranged in a 6 by 8 table layout. Each block would employ two 720 kW inverters, set along the access roads, in the middle of the panel array area.

The panel field would be laid out by installing vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver or, if soil conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Between each 720 kW power block would be 14- to 20 foot-wide roads running east-to-west, and 14 foot-wide roads running north-south to allow fire and vehicular access for the maintenance of the electrical facilities.

Meteorological station. One or more meteorological stations would be installed at the solar facility site prior to construction in order to track weather patterns. The meteorological station(s) would be attached to a data acquisition system to collect data for analysis and system monitoring. Each meteorological station would be 6 feet in height and would be set on a stainless-steel tripod base approximately 10 feet by 10 feet.

Electrical collection system. Most of the electrical collection system conductors would be underground. Power from several rows of PV modules would be conveyed to power conversion stations via underground direct current (DC) cables. DC trenches would be approximately 3 feet deep and from 1.5 to 2.5 feet wide; the DC cables would be surrounded by clean fill, and the remainder of the trench would be back-filled with native soil and compacted to 90 percent (95 percent when crossing under roadways). Power screeners may be used on site to extract the required clean fill from native soils excavated during trenching for use as bedding material in the trenches. A power screener is a motorized piece of equipment that uses moving screens to filter soils to a particular granularity.

A power conversion station and transformer would be located within each PV array. Each power conversion station comprises an inverter located within an enclosure and (approximately 11.5 feet tall) connected to a transformer. The transformers would be approximately 6.3 feet tall. Each transformer would be placed on a pre-cast concrete pad. Each pad would be delivered by flatbed truck during construction, in combination with a power conversion station vault, and installed by crane from the truck.

The PV inverters would convert the DC electric input into grid-quality alternating current (AC) electric output. The transformer would step up the voltage of the AC electrical input and then would transmit the power via underground lines to the PV combining switchgear. AC trenches would be approximately 3 feet deep and from 8 inches to 6.5 feet wide, depending on the number of cables, and would also be used to house fiber optic cables. The AC cables would be surrounded by sand, and the remainder of the trench would be back-filled with native soil and compacted.

The PV combining switchgear would transmit the power to overhead lines within the solar facility site; the overhead lines would transmit the electrical output to the on-site substation. At the on-site substation, the voltage would be stepped up to 220 kV and routed via a new gen-tie tine to the approved Southern California Edison (SCE) Red Bluff Substation (the alternative gen-tie lines are described below).

Each PV combining switchgear would collect power from a number of arrays. The PV combining switchgear cabinets would be approximately 7.5 feet tall and would be dispersed among the arrays.

Each PV combining switchgear would be placed on pre-cast 32 foot by 14.5 foot concrete pads, delivered and installed in the same manner as transformer pads and power conversion station vaults.

Because the project site is comprised of two separate parcels, electrical connection between the southern parcel and on-site substation would be required. The Applicant would seek to under-ground the electrical power conversion station connections from the southern parcel to the northern parcel along an easement on the eastern side of Kaiser Road. The route would parallel the natural gas line adjacent to Kaiser Road.

Overhead collection lines. High-capacity 34.5 kV collection system lines would connect the power output from the PV combining switchgear to the on-site substation via overhead lines. These overhead lines would be supported by wooden poles approximately 52 feet above finished grade. The overhead lines would span a distance of approximately 150 feet from pole to pole.

On-site substation. The project substation would be located in the northwest corner of the site and would cover approximately 5 acres. It would step up voltage of the solar-generated electricity to 220 kV. The project's primary 20 foot-wide access road would serve the on-site substation.

Switchyard. An electrical switchyard serves to interconnect an electrical generator to the grid. The switchyard would be constructed and operated by enXco. It would occupy an area approximately 400 feet long and 400 feet wide in the west corner of the northern parcel immediately adjacent to the substation. Transformer(s) in the switchyard would be set on concrete pads within containment areas designed to hold any accidental releases of transformer oil. All transformers would be free of polychlorinated biphenyls. The high-voltage side of the trans-former(s) would be connected to the plant's switchyard.

A small control building would be located within the switchyard and would be accessible to authorized personnel only. The building would house electrical control equipment, battery/DC systems for device operation, safety relays, and other similar electrical equipment. This building would interconnect with the main control room in the operations building for monitoring of the substation.

Security fencing. Beginning at the onset of construction, site access would be controlled for personnel and vehicles. A security fence would be installed around the plant site perimeter. An access gate would be located in the west corner. An emergency gate would be located in the southeast corner, with access to Beekley Road (north of Rice Road, west of Carr Road). The security fence would have an overall height of no more than 10 feet, including chain link fabric and three strands of barbed wire mounted on 45 degree extension arms. All required laydown areas are expected to be within the defined solar facility boundaries, and thus no additional temporary fencing would be required.

Controlled swing or rolling access gates, requiring an electronic swipe card, would be located at the facility entrance. Visitors would be allowed entry only with approval from staff, issued passes to be worn during their visit, and would be logged in and out of the facility.

Lighting and Electrical Supply. Additional security features would include motion detectors, lighting, and cameras in key locations. Exterior lighting would comply with current Title 24 regulations from the State of California. Security would be maintained as required by the engineering, procurement, and construction (EPC) contractor or a suitable subcontractor to maintain public safety and the security of the facilities.

Except as provided below, lighting during construction would be limited to the staging area for the construction trailers, parking area, and site security facilities. Lighting would be located on temporary service poles approximately 18 feet in height. Power would come from a connection to the local distribution system or from an on-site generator. If required, construction lighting would be limited to that needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operations, lighting would be limited to shielded, area-specific lighting for security purposes. Power would come from the local distribution system. The level and intensity of lighting during operations would be the minimum needed for security and safety purposes. Security lights would use motion sensors that would be triggered by movement. There would be no lights around the project perimeter, in order to minimize the project's visual impact on surrounding receptors and roads. Lights would be shielded and focused downward and toward the interior of the site to minimize lighting impacts on the night sky and to neighboring areas. Portable lighting may be used occasionally for maintenance activities during operations.

Access roads. Access would be via the existing Kaiser Mine Road, at the western boundary of the project area. Kaiser Mine Road is reached from Rice Road, just north of the on-ramp/off-ramp to Interstate 10 at Desert Center. The primary point of access to the project site would be a 20 foot-wide access road connecting the northwest corner of the solar facility to Kaiser Mine Road. Access within the project area would be provided by a grid of 14 to 20-foot wide unpaved roads to allow fire and maintenance access. The total length of on-site roads would be 109 miles.

Water requirements and sources. During the construction period, an estimated total of between 400 and 500 acre-feet of water would be needed for such uses as soil compaction, dust control, and sanitary needs. The majority of the construction water use would occur during site grading operations. The daily water demand during construction is estimated to range from a low of 125,000 gallons per day (gpd) to a peak of approximately 600,000 gpd. enXco proposes to draw water from two new and/or existing local wells to meet construction water demands. One well would continue to be used for project operations. Both wells would be available for use during construction to provide flexibility in the water supply and in the event of a well malfunction. The project's maximum well extraction rate over any 24 hour period is not expected to exceed 880 gallons per minute. Drinking water would be provided from an off-site commercial source during construction. A permanent, above-ground 5,000 gallon water storage tank would be built for O&M and as an emergency fire-fighting supply. The water tank would be about 12 feet in diameter and 13 feet tall and would be located on a round concrete slab.

The potential locations for the construction of two new on-site wells are at the northeastern and northwestern areas of the site. As an alternative to new wells, DHSP may use nearby (within 10 miles) off-site active wells. If off-site wells are used, water would be trucked to the on-site water treatment facility described below. No new roads or ground disturbance would be required for use of off-site wells.

Temporary ponds would be used for water storage during construction. A total of 3 temporary ponds are planned around the project construction site. It is anticipated that each pond would occupy approximately three-quarters of an acre and would hold approximately 21.5 million gallons. Ground water pumped from the supply wells would be piped the ponds via 6 inch HDPE pipe runs along on-site access roads or the site perimeter. No more than two or three ponds would be operating at any one time. The temporary ponds would be approximately 6 to 8 feet deep and would be fenced and lined for safety. The temporary ponds would be covered with netting to deter ravens and other wildlife. To minimize earth work, most of the ponds would be co-located with planned retention basins that would be used during project operation to contain storm water runoff. Storm water pollution prevention BMP controls would be incorporated with the retention basins.

The ponds would be filled by pumps running 24 hours per day at up to 600 gallons per minute. A float valve in each pond would control overflow. Water would be pumped from the pond into large temporary storage tanks (stand tanks) using hurricane pumps. Water would be transferred directly to trucks from the stand tanks, as needed for dust control and compaction during construction.

Reverse osmosis system. A water treatment facility and demineralization evaporation pond may be required to treat well water, depending upon total dissolved solids (TDS) content. Panel washing requires water with very low TDS. A water treatment system consisting of a double-pass reverse osmosis (RO) system may be installed near the main O&M well, most likely adjacent to the on-site project substation. It would be enclosed in a small structure approximately 6 feet wide by 12 feet deep and approximately 6 feet high. This system would produce up to approximately 20 gallons per minute (gpm) of low-TDS water and approximately 9 gpm of reject water. This reject water would be piped to a lined evaporation pond with four sections comprising approximately 1 acre total. Residue would be periodically removed from the ponds and disposed of at an approved facility. enXco would re-purpose one of the construction holding ponds as a settling pond for RO reject water.

Gravel, aggregate, and concrete requirements and sources. Gravel would be required for the north-south access roads (not for the less often used east-west routes) and would be sifted from on-site soil, or obtained from a BLM-approved commercial mine approximately 6 miles from the project site. Road aggregate required for the on-site access roads would amount to 17,500 cubic yards.

Concrete would be required for the inverter pads and the switchyard. Concrete for the inverter pads and vertical H-pile supports, if needed, would be pre-poured and transported to the site by truck. Concrete for the switchyard and asphalt for the parking area would be trucked to the site. If commercial ready-mix concrete supply is not sufficient, a temporary, two-acre concrete batch plant would be installed in the construction laydown area.

1.1.2 Construction Activities

Construction schedule and phasing Site preparation would begin shortly after final permitting is complete. Construction is anticipated to commence during the 3rd quarter of 2012, and continue through the 4th quarter of 2014, in two phases. Commercial operation would also be phased and the first phase of operation would commence during the 3rd quarter of 2013, with commercial operation of the final phase commencing during the 4th quarter of 2014. The construction schedule would be as follows:

Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary at times, due to weather or specific construction activities.

Construction workforce. The on-site workforce would consist of laborers, craftsmen, supervisory personnel, supply personnel, and construction management personnel. The maximum number of on-site personnel would be 250 individuals at any one time during construction. An average workforce of 100 is anticipated during construction.

Construction waste management. Portable bathrooms would be provided on-site during construction and would be emptied in an approved off-site facility; domestic wastewater generated during construction would not be disposed of on-site.

Construction vehicles and equipment. During construction, the number of truck loads and the tonnage delivered would be on the order of about 15,000 tons of equipment and materials. Construction equipment would include front end loaders (3), backhoes (8), scrapers (5), bulldozers (2), graders (5), hydraulic rams (10), cranes (2), power screeners (3), and pile drivers (10).

Vegetation removal and treatment. Once fencing is erected, site preparation would consist of removal of vegetation within the project area by scarification where necessary; for example, along the access roads. Approximately 10 percent of the entire project area would be scarified to remove vegetation on all the access roads between the 1.44 MW rows of solar panels. In addition, any vegetation over 18 inches tall would be removed to avoid interference with the solar panels. Preparation would likely proceed by section, so that only the portion of the project area where panels would be laid out over a period of 6 months would be scarified at any one time.

Key considerations for vegetation treatment of the site would include:

- Soil disturbance in support of construction would increase the possibility of introduction of invasive species. Regular monitoring and weed management would be required during construction. Ongoing maintenance in the solar field may include treatment of noxious weeds by targeted spraying with Roundup® (a common formulation of the herbicide glyphosate). Pursuant to BLM requirements, an Integrated Weed Management Plan will be prepared and implemented for the project.
- Where temporary access is needed to install facilities, such as along the perimeter fencing, no removal of existing vegetation or grading would occur. Instead, equipment would drive over or around existing desert scrub vegetation without direct removal. Crushed vegetation is much more likely to show a rapid recovery than where vegetation is removed and reseeded, or where soils are disturbed. The Applicant is not expecting that final plans would require any disturbance outside the final perimeter fencing.
- Revegetation with native species would be implemented where feasible in areas of temporary disturbance. Pursuant to BLM requirements, a Revegetation Plan will be prepared and implemented for areas temporarily disturbed during project construction.

Solar array assembly and construction. After site preparation, the panel field would be laid out by installing the vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. If further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts. Once the foundations are secure, trenching would be dug along the perimeter of the 1.44 MW units, to tie the inverter blocks together, and the electrical conduit and wires would be laid down. Next, the framing would be bolted to the vertical support beams. Once framing is complete, panels would be installed on the frames. Finally, the pre-poured concrete inverter pads would be laid down and the inverters would be secured to the pads, and the electrical wiring would be completed.

During construction, electric power for construction activities would be derived from the distribution lines along the southern side of the project site, or by mobile generators. Up to five mobile generators would be located at the laydown area (at the northwest corner of the site). Each generator would produce 60 dB(A) of noise at 23 feet.

1.1.3 Operations and Maintenance Activities

Staff and equipment. The project would employ 8 full-time staff during operations. Maintenance staff would access the facility using 4 diesel engine pickup trucks. The trucks would travel to the site daily from an off-site O&M building (located within 10 miles of the site) or an optional on-site building.

Roads and vegetation. Operations and maintenance (O&M) of the facility would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. Additional gravel or surface treatments may be required. Vegetation would be allowed to re-grow within the solar panel field, but would be maintained below a height of 18 inches to prevent interference with solar panels. The access roads in the solar panel field would be maintained free from significant vegetation through the use of targeted spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

Operational water requirements and sources. During operation, water would be required for solar panel washing two to three times per year. If off-site wells are used, water would be trucked to the project site from up to 10 miles away in up to 1,200 water trucks annually. Panel wash water would be purified using the on-site reverse osmosis system (above). The total water used would be between 18 and 27 acre-feet per year. Domestic wastewater would be treated and disposed at the site using a septic disposal system consisting of septic tanks and leach field.

Aviation Lighting. enXco anticipates no aviation restrictions for the project. No structures would be taller than the height requiring aviation lighting.

1.1.4 Decommissioning Activities

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be longer or shorter. When permanent closure is appropriate, a decommissioning plan will be prepared and submitted to the BLM for review and approval. Closure strategies may include temporary "mothballing"; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and restoration of the land to BLM-approved specifications. Fully decommissioning the site would involve removal and demolition of above-ground and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

1.1.5 Project Alternatives

In addition to enXco's proposed project, the DEIS addresses two smaller solar field designs. Both alternatives would be located at the same ROW. These action alternatives are summarized below.

Alternative 5 – Solar Project Excluding WHMA: Alternative 5 would have the same project boundaries as the proposed project, except that it would exclude the portion of the site which is within the Palen-Ford Wildlife Habitat Management Area (WHMA), as shown on Figure 4a, Alternatives to the Proposed Action. Alternative 5 would encompass approximately 1,161 acres. It would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 47-acre reduction in the size of the Alternative 4 site.

Alternative 6 – Reduced Footprint Solar Project: Alternative 6 would have the same project boundaries as the proposed project, except that it would exclude the smaller southern parcel of the project, as shown on Figure 4b, Alternatives to the Proposed Action. Alternative 6 would encompass approximately 1,044 acres. Because Alternative 6 would not include the disjunct ROW parcel, it would not require an underground electrical connection between southwestern and northeastern parcels described for the proposed project. Alternative 6 would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 164-acre reduction in the size.

1.1.6 Gen-tie line

The proposed gen-tie, Alternative B, is the same gen-tie line as proposed by the approved adjacent Desert Sunlight project and described in the Desert Sunlight EIS (BLM 2011b) as Alternative A-1. Because the Desert Sunlight gen-tie has not yet been constructed (as of December 2011), the effects of constructing, operating, and decommissioning gen-tie Alternative B are analyzed in the EIS and described here without the presumption that the approved Desert Sunlight gen-tie would be built. However, if the Desert Sunlight gen-tie line were to commence construction prior to or at the same time as the construction schedule for the proposed action, then the proposed gen-tie line would instead consist of an additional line strung on the gen-tie line towers of the Desert Sunlight project. Under such a scenario, stringing of enXco's gen-tie line would occur concurrently with construction of Desert Sunlight's gen-tie line, and would require no additional equipment, personnel, or time beyond that already required and approved for Desert Sunlight's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider. The proposed alignment is shown on Figures 1 and 2. The gen-tie line would be on steel monopoles, which would be approximately 135 feet tall. Typical spans between poles would be approximately 900 to 1,100 feet.

Construction scheduling and mobilization. Construction would begin 3rd or 4th quarter, 2012 (depending on Record of Decision [ROD] issuance) and would last for 12 months. Gen-tie construction would occur concurrently with Desert Sunlight, if feasible. Over a 12 month construction period, the gen-tie workforce will average 30 employees, with no more than 65 employees at any one point. A total of approximately 240 material deliveries are expected during the 12 month construction period for the gen-tie line.

Work site and access road clearing. Access roads and work areas at each structure location would be cleared and graded. Clearing and grading would also be needed for conductor pulling and tensioning sites and temporary guard structure sites at road or utility crossings. Laydown yards would all be within the project footprint and would not require any additional ground disturbance. The total area of permanent and temporary disturbance is estimated as 92 acres.

Tower construction. Structures would be picked up from the material storage yard, hauled to tower locations or marshalling yards. The pole base and top sections of each structure would be assembled in sections on the ground, using hydraulic cranes. After assembly, each structure would be erected onto a foundation (either shaft anchor-bolted foundations, drilled shaft embedded foundations, or vibrated steel casings), using a crane.

Operations and maintenance. DHSP operations and maintenance personnel would perform periodic maintenance of the gen-tie line, and no additional personnel would be required. Operation and maintenance would involve periodic inspection via helicopter or truck. The transmission lines would be maintained on an as-needed basis and would include maintenance of access roads and erosion/drainage control structures.

Decommissioning. A final Decommissioning Plan would be developed prior to facility closure, based on conditions at that time. The Decommissioning Plan would be developed in coordination with the BLM and submitted to the BLM for review and approval prior to final closure.

1.1.7 Gen-tie Alternatives

In addition to the proposed gen-tie alignment, three other alignments are under review (alternatives C, D, and E in the DHSP EIS; see Figure 2). Alternative C would be constructed on separate towers immediately adjacent to the approved Desert Sunlight gen-tie line; gen-tie alignment Alternative D, or the cross-valley alignment, was described in the Desert Sunlight EIS as Alternative A-2; and gen-tie alignment Alternative E is a new alternative that was not reviewed in the Desert Sunlight EIS. The transmission support structures, construction activities, and other aspects of construction for gen-tie Alternatives C, D, and E would be as summarized above for the proposed gen-tie.

1.2 REGULATORY SETTING

This BBCS was prepared to ensure Project compliance with state and federal statutes protecting native birds, as well as NEPA and CEQA requirements to disclose environmental effects of the project, and provide public opportunity for comment. These applicable statutes are summarized below:

1.2.1 Federal Regulations

Endangered Species Act of 1973. The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 9 prohibits the take of any fish or wildlife species listed as endangered and most species listed as threatened, and defines *take* to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harm* is further defined to mean "any act that kills or injures the species, including significant habitat modification." *Harass* is further defined as actions that create the likelihood of injury to listed species to an extent as to significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

The ESA also includes mechanisms for allowing exceptions to the Section 9 take prohibitions. Section 7 requires federal agencies, in consultation with the US Fish and Wildlife Service (USFWS) to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered terrestrial wildlife species or result in the destruction or adverse modification of critical habitat for these species. Under Section 7, USFWS may authorize limited, incidental take (i.e, incidental to carrying out otherwise lawful activities) of listed species in a Biological Opinion.

The project is not expected to affect federally listed threatened or endangered bird or bat species, though it is possible that such federally listed migratory species may be found in the project vicinity during seasonal migrations.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (16 U.S.C. §§ 703, et seq.; MBTA) prohibits the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts, and nests, except where specifically authorized by the USFWS (e.g., hunting waterfowl and upland game species). Under the MBTA, *migratory bird* is broadly defined as "any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle" and thus applies to most native bird species. Except where specifically permitted, most actions that cause bird mortality or result in the permanent or temporary possession of migratory birds or any associated body parts, feathers, eggs or nests, constitute violations of the MBTA.

The USFWS recommends that electric utilities and utility-scale renewable energy project developers prepare and implement Bird and Bat Conservation Strategies to minimize the incidental take of migratory birds.

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d; BGEPA) prohibits take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). The BGEPA defines '*take*' to include "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing." The USFWS (2007) further defines '*disturb*' as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Therefore, the requirements for guarding against impacts to eagles generally are more stringent than those required by the MBTA alone.

The USFWS can authorize take of bald and golden eagles when the take is associated with, but not the purpose of, an otherwise lawful activity, and cannot practicably be avoided (50 CFR § 22.26). In order to authorize take, the USFWS must determine that the proposed action is consistent with the goal of maintaining stable or increasing breeding populations. That is, any authorized take must be offset or mitigated by the proposed action.

1.2.2 State Regulations

California Endangered Species Act. The California Endangered Species Act (CESA) prohibits take of wildlife listed as threatened or endangered and defines '*take*' as any action or attempt to "hunt, pursue, catch, capture, or kill." CESA also allows exceptions for take that occur incidental to otherwise lawful activities. Approval requires minimization and full mitigation of projected impacts. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if CDFG determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code § 2080.1. For projects that will result in take of a species listed under CESA but not under the federal ESA, the applicants must apply for a take permit under § 2081(b).

Native Birds (California Fish and Game Code, Sections 3503 and 3513). California Fish and Game Code § 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; § 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and § 3513 provides for the adoption of the MBTA's provisions (above). With the exception of a few non-native birds such as European starling, the take of any bird or loss of active bird nests or young is regulated by these statutes. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

California Fully Protected Species. Prior to enactment of CESA and the federal ESA, California enacted laws to "fully protect" designated wildlife species from take, including hunting, harvesting, and other activities (Fish and Game Code § 3511). Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected, including golden eagle and several other desert species.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Communities Conservation Plan approved by CDFG. The legislation gives fully protected species the same level of protection that is provided under the Natural Community Conservation Planning Act for endangered and threatened species (below).

Natural Community Conservation Planning Act (Fish and Game Code Sections 2800-2835). The Natural Community Conservation Planning (NCCP) Act of 1991 (amended in 2002) was established to provide a regional approach to conservation for multiple species, in contrast to the single-species approach implemented under CESA and ESA. The NCCP Program is implemented by CDFG as a cooperative effort by the State of California and private and public partners, designed to protect species and their habitats through an ecosystem approach. The program helps identify and provide for large area-wide protection of plants, animals, and their habitats while allowing for compatible and appropriate economic activity.

The NCCP Act promotes conservation of unfragmented habitat areas, promotes multispecies and multihabitat management and conservation, and promotes the conservation of broad-based natural communities and species diversity. It provides an option for identifying mitigation that is proportional to a project's impacts to biological resources. Participation in the NCCP program is a voluntary mechanism that can provide an early planning framework for proposed development projects.

The Desert Renewable Energy Conservation Plan (DRECP) is being developed by BLM, USFWS, CDFG, and the California Energy Commission (CEC). It is intended to protect California desert ecosystems (including the project area), while allowing for appropriate development of renewable energy projects. The DRECP is scheduled to be completed in 2012. The DRECP, upon completion, will be an NCCP. The DHSP site is within the geographic area to be covered by the DRECP.

2.0 AGENCY COORDINATION

enXco has initiated a series of meetings with state and federal resource agencies (BLM, USFWS, and CDFG) to discuss environmental review of the DHSP, including review of potential impacts to native birds, and minimization or mitigation of those impacts. Meetings and other communications relative to this Bird and Bat Conservation Strategy took place on:

- November 5, 2010 – Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office (by phone), and Aspen;
- April 20, 2011 - Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, Marine Corps Air Station 29 Palms, Joshua Tree National Park, and Aspen;
- June 22, 2011 – Presentation by enXco to REAT member agencies at California Energy Commission, Sacramento, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, CDFG Inland Deserts Region and Aspen;
- Weekly agency coordination conference calls, beginning August 29 2011, participants vary.

Other communications relating to bird and bat conservation include:

- A checklist provided by BLM Renewable Energy Coordination Office in January 2011, listing biological survey needs for the project; the checklist included golden eagle surveys and general avian breeding and winter season point counts;
- enXco, USFWS Carlsbad Fish & Wildlife Office, and Aspen staff discussed baseline golden eagle data recommendations during a conference call on 28 April 2011;
- A letter provided by USFWS, commenting on the project Notice of Intent (NOI) reading, in part:

  > *"Migratory birds are federally protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.) and under Executive ruder 13186 - Responsibility of Federal Agencies to Protect Migratory Birds. Based on the Service's management authority for migratory birds under the MBTA, we also recommend that the EIS include an evaluation of potential impacts to migratory and resident birds, particularly the western burrowing owl. Western burrowing owls have been documented in the project area and we recommend protocol surveys for the species be conducted in support of the EIS analysis. In addition to MBTA, eagles are protected under the Bald and Golden Eagle Protection Act. Active and inactive golden eagle nests were documented in 2010 within close proximity to the proposed project. Since nesting patterns change annually, we recommend providing up-to-date biological information about golden eagles within a 10 mile radius of the project area for the EIS analysis. Please refer to the Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010) for appropriate survey methods.*
  >
  > *"Finally, to minimize impacts from linear project features, we recommend co-locating these components to the extent practicable with First Solar's Desert Sunlight project. Co-location opportunities include utilizing a common generation tie line alignment, right-of-way, and access roads, and sharing the northernmost boundary security fencing."*

- An on-site field meeting, including USFWS staff from the Carlsbad and Palm Springs Fish & Wildlife Offices, and Aspen, on November 17, 2011.

3.0 SITING

3.1 SITE OVERVIEW

The DHSP site is located in the upper Chuckwalla Valley, on public lands administered by the BLM in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way Application consists of two non-contiguous parcels (Figures 1 and 2). The large, northeastern parcel is 1,070 acres and the smaller, southwestern parcel is 270 acres. Portions of each parcel extend to the west of Kaiser Road (County Route R2); enXco does not propose to construct solar facilities within the Kaiser Road right of way, or west of Kaiser Road. With these areas excluded from the analysis, the total solar facility project area is approximately 1,208 acres, consisting of 1051 acres in the larger parcel, and 157 acres in the smaller one.

The site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. The Desert Sunlight Solar Project, now under construction, is located to the immediate north of the DHSP site

(Figure 2). The Desert Sunlight project was recently approved (BLM 2011b; 2011c) and will occupy 3,761 acres when fully built out. Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford WHMA, also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 3). Some of the private lands to the south and west have been developed as residential and agricultural lands. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

3.2 HABITAT

Two vegetation types cover the proposed solar generator site and generator tie-line Alternatives B, C, and D (Figures 5 and 6): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde-Ironwood Woodland (*Parkinsonia florida-Olneya tesota* Woodland Alliance) (Sawyer et al. 2009). The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo-Verde-Ironwood Woodland is a subset of his description of Desert Dry Wash Woodland. Small, closely-spaced, braided ephemeral channels are abundant throughout the project site (Figure 7). There also are small areas within the proposed solar generator site where natural vegetation has been removed or disturbed for roads and other land uses. In most cases (e.g., narrow roads), these areas are too small for mapping at this scale; however, the proposed solar generator site overlaps a narrow area disturbed for date palm agriculture (on an adjacent parcel) in the southeastern corner of the site. This area is mapped as "Disturbed / Disused Agriculture" on Figures 5 and 6.

In addition, disturbed areas are located along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length. Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and creosote bush scrub on partially stabilized sand fields (Figure 6).

Creosote Bush Scrub (bajada/alluvial landforms). Creosote Bush Scrub on the site is characterized by low shrub species diversity and relatively wide spacing of shrubs, usually with bare ground between. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta (*Pleuraphis rigida*). This vegetation also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil's spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory's rock daisy (*Perityle emoryi*). There are 1,026 acres of creosote bush scrub mapped on the proposed solar project site. Creosote Bush Scrub has no California Department of Fish and Game special-status designation (CDFG 2010a). Each of the generator tie-line alternatives would affect a limited additional acreage of creosote bush scrub, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on the site matches the Desert Scrub wildlife habitat described by Laudenslayer and Boggs (1988). Within the project area it provides habitat for wildlife species typical of the California deserts, including burrowing species such as kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp., *Chaetodipus* spp.), and desert cottontail (*Sylvilagus audubonii*); and mesopredators such as desert kit fox (*Vulpes macrotis arsipus*) and coyote (*Canis latrans*). This community also serves as habitat for numerous species of reptiles including desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidocelis tigris tigris*) and zebra-tailed lizard (*Callisaurus draconoides*). Common birds observed within this vegetation included black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Blue Palo Verde-Ironwood Woodland. Blue Palo Verde-Ironwood Woodland occurs throughout the project area primarily in dry washes and is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia florida*). Additional tree species such as smoketree (*Psorothamnus spinosus*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. It is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland 1986; Schoenherr and Burk 2007). Vegetation in desert washes is generally taller, up to approximately 9m (30 ft) in height, and denser than surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of big galleta, cheesebush (*Hymenoclea salsola*), desert lavender (*Hyptis emoryi*) and other shrubs and subshrubs. Blue Palo Verde-Ironwood Woodlands on the site match the desert wash wildlife habitat described by Laudenslayer (1988). This habitat provides greater food, nesting, and cover resources than the surrounding creosote bush scrub, and wildlife diversity is generally greater than in the surrounding desert. Examples of species that depend in part on desert microphyll woodlands include vermillion flycatcher and black-tailed gnatcatcher. In addition, many of the species occupying the surrounding creosote bush scrub are found in greater numbers in microphyll woodlands. This community is ranked by CDFG (2010a) as a special-status vegetation type, with state rarity ranking of S3. There are 180 acres of Blue Palo Verde –Ironwood Woodland on the proposed solar project site. Each of the generator tie-line alternatives would affect a limited additional acreage of this woodland vegetation, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on Partially Stabilized Sand Fields. Creosote Bush Scrub occurs on partially stabilized sand fields in the eastern portion of gen-tie Alternative E. This area is located at the western margin of a much larger dune system associated with Pinto Wash, at the base of the Coxcomb Mountains. This vegetation matches the description of "Creosote Bush Scrub," above, but the cover is much sparser and the substrate consists of partially stabilized sand fields with accumulations of sands mounded at the bases of the shrubs. This habitat is suitable for a series of special status plants and animals, including Mojave fringe-toed lizard, which were reported in the area in the Desert Sunlight EIS and observed there by Aspen field staff. None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Acreage impacted by Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Active Sand Dunes. Active sand dunes are found on gen-tie Alternative E. These dunes are at the western margin of the larger Pinto Wash / Coxcomb Mountains dune system, above. This habitat is characterized by fine aeolian (i.e., wind-blown) sands that support very little vegetation. Vegetation on the dunes is sparse, but dominated by scattered creosote bush and Russian thistle (*Salsola* sp.). None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Impacts acreage would be dependent on the specific locations of access roads, transmission line structures, and work sites.

4.0 BIRD AND BAT SPECIES OF THE PROJECT VICINITY

4.1 INFORMATION COMPILED TO DATE (PRE-CONSTRUCTION SURVEYS)

The following discussion of bird and bat occurrence in the area is based on field surveys conducted by Aspen and AMEC field staff the Desert Harvest project, and a review of field surveys for previous projects in the vicinity (Aspen 2012). Aspen and AMEC biologists reviewed the California Natural Diversity Data Base (CNDDB; California Dept. of Fish and Game, CDFG 2011a) to identify special status species known from the area. We also reviewed applicable documents pertaining to the Desert Sunlight project, including the vegetation and wildlife sections of the Environmental Impact Statement (BLM 2011a) and the Biological Resources Technical Report (Ironwood Consulting 2011). During all field surveys conducted for the Desert Harvest project, all incidental bird species observations were recorded in field notes.

AMEC biologists conducted avian point count surveys during winter and spring of 2011 to comply with BLM requirements (2009). Winter season point counts were conducted during January 2011, and breeding season point counts were between March 30 and April 28, 2011. A total of 45 bird species was detected during the study, including the winter season, and nesting season point count data and incidental observations made during both seasons. The methods and results are described in the attached report (AMEC 2011), and pertinent data are incorporated into this BBCS.

Most of the birds occurring in the project vicinity have no special conservation status (Aspen 2012), but all native birds are protected under the federal MBTA and California Fish and Game Code, as described in Section 1.2 above. In addition to the common birds of the area, a list of special-status bird and bat species with potential to occur in the vicinity of the proposed project was compiled. Species were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal ESA;
- Listed as threatened or endangered, or candidates for listing under CESA;
- Designated by BLM as Sensitive Animals (BLM 2010);
- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

All special-status species identified by this literature review, and others known from the general region, are included in Table 1, which summarizes the natural history, agency status, and occurrence probability on the site for each species.

Table 2. Special Status Bird and Bat Species of the Chuckwalla Valley Area.

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
BIRDS				
Circus cyaneus Northern harrier	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Foraging: Expected rarely, mainly winter
Aquila chrysaetos Golden eagle	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: Eagle Protection act (see text) Calif: SSC S3 fully protected	Nesting: Minimal on-site (no suitable nest sites); occurs in surrounding mtns Foraging: High (year-around)
Pandion haliaetus Osprey	Nests in northern N America and Mexican coastlines near large water bodies, preys primarily on fish; winters in central Calif to S America;	Spring and fall migr. seasons	Fed: none Calif: S3, watch list (nesting)	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
Buteo swainsonii Swainson's hawk	Breeds in trees in open habitats (e.g., grassland), Central Valley (Calif.) and east to cent. US, S. Canada, N. Mexico; winters in S America. A few nesting records in W Mojave Des (e.g., Lancaster area)	Spring and fall migr. seasons	Fed: none Calif: S2, **THR**	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
Buteo regalis Ferruginous hawk	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: none Calif: SSC S3S4 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
Accipiter striatus Sharp-shinned hawk	Nests and hunts in forest & woodland mainly to N (may breed in S Calif. Mtn woodlands); also forages in open areas; regularly winters in S Calif.	Winter	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat, outside range) Winter/Migration present (Jan 2011)
Accipiter cooperii Cooper's hawk	Nests and hunts in forest &woodland, also forages in open areas; most of US, Central and S America	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Winter/Migration expected
Falco columbaris Merlin	Uncommon in winter in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none Calif: SSC S3 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
Falco mexicanus Prairie falcon	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
Athene cunicularia (*Speotyto cunicularia*) Burrowing owl	Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S Calif.; occurs through W US and Mexico	Year-around	Fed: none Calif: SSC S2 (burrow sites)	Present (Sep 2011); see text

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
Falco peregrinus American peregrine falcon	Nests on high cliffs, generally near water bodies; feed on birds (esp. shorebirds & waterfowl); widespread but rare worldwide	Spring - summer	Fed: none (former END) BLM: sensitive Calif: FP, S2 (former END)	Nesting: Minimal (no suitable nest sites; well outside breeding range) Foraging: Minimal (outside winter range, no suitable prey base)
Asio flammeus Short-eared owl	Breeds in marshes and densely vegetated wetlands, forages over open wetlands, ag fields, and grasslands; temperate N & S America, Eurasia	Year-around	Fed: none Calif: S3, SSC (nesting)	Breeding: Minimal (no habitat) Winter: reported near Lake Tamarisk
Asio otus Long-eared owl	Breed in riparian woodlands; forage (nocturnally) over open land; sea level to about 6000 ft. elev.; through N America and Eurasia	Year-around	Fed: none Calif: S3 SSC (nesting)	Breeding: Minimal (no habitat) Winter: Occurs at Lake Tamarisk
Chaetura vauxi Vaux's swift	Breeds central Calif. and northward, in coastal and montane forests; winters in Central and S America	Spring and fall migr. seasons	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (outside range) Migration: Present, occasional flyover
Melanerpes uropygialis Gila woodpecker	Saguaro woodlands, sometimes other woodlands; cavity nester mainly in cactus; SE Calif., S Ariz, W Mexico (incl. Baja)	Year - around	Fed: none BLM: Sensitive Calif: **END** S1S2	Nesting: Minimal (ironwood poor for nest constr.) Winter: Present (Jan 2011); see text
Lanius ludovicianus Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.	Year-around	Fed: none Calif: SSC S4 (nesting)	Present (suitable habitat throughout)
Aphelocoma californica cana Scrub jay (Eagle Mtn population)	Locally endemic year-around resident in pinyon woodlands in the Eagle Mountains; long-disjunct from other populations	Year-around	Fed: none Calif: CDFG watch list, S1S2	Present (observed as transient, Oct 2011)
Toxostoma bendirei Bendire's thrasher	Joshua tree woodland, desert scrub; high cactus cover; mainly E Mojave Des in Calif. (scarce in W Mojave); American SW and mainl. Mexico; winters in S Arizona, New Mexico, and mainl. Mexico	Spring-summer	Fed: none BLM: Sensitive Calif: SSC S3	Low-Moderate; marginal habitat throughout
Toxostoma crissale Crissal thrasher	Nests in dense, low, brushy thickets of mesquite or other desert riparian shrubs; Sonoran Des, E Mojave Des, to Texas, W mainland Mexico	Year - around	Fed: none Calif: SSC S3	Low-moderate; habitat marginally suitable
Toxostoma lecontei LeConte's thrasher	Calif. deserts, SW Central Val. & Owens Val., east to Utah, Arizona; open shrubland, often sandy or alkaline flats	Year - around	Fed: none Calif: S3 (SSC in San Joaquin Val)	High; suitable habitat throughout
Pyrocephalus rubinus Vermillion flycatcher	Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico	spring - summer	Fed: none Calif: SSC S2S3 (nesting)	Nesting: Moderate (suitable nesting habitat in ironwood stands)

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
Vermivora luciae Lucy's warbler	Cavity-nesting species; breeds in desert riparian woodlands through much of Arizona; winters on Pacific Coast of mainl. Mexico	spring - summer	Fed: none BLM: Sensitive Calif: SSC S2S3 (nesting)	Nesting: Low-moderate (margin of known range; few nest cavities avail.); singing males observed April 2011
MAMMALS				
Antrozous pallidus Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif, SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: none BLM: Sensitive Calif: SSC S3	Low potential for roosting on site; high potential for foraging in area
Corynorhinus (*Plecotus*) *townsendii* Townsend's big-eared bat (incl. "pale," "western," and other subspecies)	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: none BLM: Sensitive Calif: SSC, S2S3	Low potential for roosting on site; high potential for foraging in area
Euderma maculatum Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Not known	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting or foraging on site
Eumops perotis californicus California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: none BLM: Sensitive Calif: SSC S3?	Low potential for roosting on site; high potential for foraging in area
Lasiurus xanthinus (*Nycteris ega xanthina*) Western (Southern) yellow bat	Mexico and Cent. Amer., to S AZ; Riv., Imperial and San Diego Cos.; riparian and wash habitats; roosts in trees; evidently migrates from Calif. during winter	Spring-summer?	Fed: none Calif: S3	Low potential for roosting on site; high potential for foraging in area
Macrotus californicus (*M. waterhousii*) California leaf-nosed bat	Arid lowlands, S Calif., S and W Ariz., Baja Calif. and Sonora, Mexico; roost in mine-shafts, forage over open shrublands	Year-around	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area
Nyctinomops macrotis (*Tadarida molossa*) Big free-tailed bat	Roosts in crevices of rocky cliffs, scattered localities in W N. Amer. through Cent. Amer.; ranges widely from roost sites; often forages over water	Year-around (?)	Fed: none Calif: SSC S2	Low potential for roosting on site; high potential for foraging in area
Nyctinomops femorosaccus (*Tadarida femorosaccus*) Pocketed free-tailed bat	Deserts and arid lowlands, SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs; forage over water and open shrubland	Year-around	Fed: none Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area

General References: American Ornithologists Union 1998; Barbour and Davis 1969; CDFG 2011a; 2011b; Feldhammer et al. 2003; Garrett and Dunn 1981; Grinnell and Miller 1944; Hall 1981; Rosenberg, et al. 1991; Schuford and Gardali 2008.

Conservation Status

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of Category 2 candidates, described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no SOC category.

END: Federally listed, endangered.

THR: Federally listed, threatened.
Candidate: Sufficient data are available to support federal listing, but not yet listed.
Proposed: Formally proposed for federal status shown.

***State designations*:** (California Endangered Species Act, California Dept. of Fish and Game)
END: State listed, endangered.
THR: State listed, threatened.
RARE: State listed as rare (applied only to certain plants).
SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.
S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: All California occurrences historical (i.e., no records in > 20 years).
SX: Presumed extirpated in California.

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.
Occurs: Observed on the site by qualified biologists.
Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.
High: Habitat is a type often utilized by the species and the site is within the known range of the species.
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

4.2 LISTED THREATENED OR ENDANGERED SPECIES

Gila woodpecker (*Melanerpes uropygialis*). The Gila woodpecker is listed as endangered under CESA but has no status under the federal ESA. It is identified as bird species of conservation concern (USFWS 2008). Its geographic range is generally in southern Arizona and southward into Baja California and western mainland Mexico. It occupies this range year-around (i.e., it is not migratory). In California, Gila woodpeckers are known from riparian forests along the Colorado River, and from desert wash woodlands in Imperial County (McCreedy 2008). It excavates cavity nests in large riparian trees such as cottonwoods and (in upland habitats) saguaro cacti, and feeds largely on insects, mistletoe berries, and cactus fruits (Rosenberg et al. 1991; McCreedy 2008). Its primary habitat is cottonwood-willow riparian woodland, but it also uses thickets of other desert trees (e.g., desert ironwood), as well as upland habitats, especially outside the breeding season. Desert ironwood is apparently too dense for nest excavation. Where Gila woodpeckers occur in dry desert wash woodlands, they excavate cavity nests "invariably" in large blue palo verdes rather than ironwood (McCreedy 2008). In suburban habitats, they nest in ornamental trees including athel (*Tamarix aphylla*), eucalyptus, and palms. Availability of suitable nesting trees is apparently a limiting factor in breeding habitat suitability (Grinnell and Miller 1944).

DHSP occurrence: A Gila woodpecker was observed in the southeastern part of the project site in December 2010 (AMEC 2011), but was not seen again during the BLM protocol winter season or breeding season avian point counts. The Desert Harvest project site is about 40 miles west of the Gila woodpecker's published geographic range (McCreedy 2008), but unpublished observations have been reported from Corn Springs, about 11 miles south of the site and about five miles south of the southern end of the gen-tie alignments (C. McGaugh, AMEC, pers. obs.). There is a native palm grove at Corn Springs, and Gila woodpeckers may nest in the palm trees. Also, a Gila Woodpecker was reported on 28 September 2010 at the Desert Sunlight Project site (AMEC 2011). It is possible that the Corn Springs and Desert Center areas support a small Gila woodpecker population, or that the two local observations in late 2010 were chance observations of an itinerant individual.

Desert wash woodlands on the Desert Harvest site may provide suitable nesting and foraging habitat for Gila woodpecker. The woodlands are dominated by desert ironwood trees, and most of the blue palo verdes are too small for cavity nests. However, scattered larger blue palo verde trees are present in low numbers throughout the woodlands, and could serve as suitable nest trees.

Swainson's hawk (*Buteo swainsoni*). The Swainson's hawk is listed as a threatened species under CESA but has no federal listing status. It is a migratory raptor. It breeds in open plains and prairies in the Great Plains and relatively arid areas of western North America, including the Central Valley and the western Mojave Desert in California. It winters in South America, primarily in Argentina. During the spring and fall migration seasons, Swainson's hawks are observed regularly in southern California.

DHSP occurrence: One Swainson's hawk was observed flying over the Desert Harvest project site during April 2011 (AMEC 2011). The project area may serve as incidental foraging habitat during migratory seasons, but otherwise would not support Swainson's hawks, due to the distance from its breeding range. Project development would not affect nesting habitat and has little likelihood of adversely affecting Swainson's hawk.

4.3 SPECIES PROTECTED UNDER THE FEDERAL BALD AND GOLDEN EAGLE PROTECTION ACT

Golden Eagle (*Aquila chrysaetos*). Golden eagles are year-around residents throughout most of their range in the western United States. In the southwest, they are more common during winter when eagles that nest in Canada migrate south into the region. They breed from late January through August, mainly during late winter and early spring in the California deserts (Pagel et al. 2010). In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests. Golden eagle foraging habitat consists of open terrain such as grasslands, deserts, savanna, and early successional forest and shrubland habitats, throughout the regional foothills, mountains, and deserts. They prey primarily on rabbits and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002).

Threats to golden eagles include illegal shooting, power line electrocution, wind turbine strikes, and rodenticides (used for rodent control, and secondarily ingested by eagles feeding on target pest species). They also are affected by habitat loss or degradation due to land use changes such as urbanization and agriculture. The golden eagle population is estimated at approximately 27,000 in the western U.S., and an apparent ongoing decline in numbers (Farmer 2008; USFWS 2009).

Absent interference from humans, the densities of breeding golden eagle territories is limited by either prey density or nest site availability (USFWS 2009). Breeding season home range sizes vary widely. For example, in San Diego County, a study of 27 nesting pairs found breeding ranges to average 36 square miles with a range from 19 to 59 square miles (Johnsgard 1990). Eagles and other raptors forage more widely outside of the nesting season, since they have no need to return daily to eggs or young at their nests.

DHSP occurrence: The mountain ranges surrounding the project site provide suitable golden eagle nesting habitat. There were 8 inactive golden eagle nests documented to the northwest, northeast, and south of the Desert Harvest site, and one active but non-reproductive nest was reported in the Coxcomb Mountains, about 4 miles northeast of the site (BLM 2011a). Even if golden eagle territories may be inactive in a given year, they may be used in future years. Therefore, unoccupied territories are considered potentially active in future years. The proposed solar generator site and gen-tie line alignments are on the Chuckwalla Valley floor, and do not provide suitable golden eagle nesting habitat. No on-site impacts to nest sites are expected, but golden eagles are sensitive to human disturbances during the nesting season. If there is an active nest nearby, then human activity and noise during project construction could adversely affect golden eagle nesting success.

The project site and gen-tie alignments provide suitable golden eagle foraging habitat. Golden eagles could forage at the Desert Harvest site at any time of year. Foraging birds could include mated pairs using the surrounding nesting territories; or, if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed, could forage over the site during breeding season. Foraging would be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges.

4.4 SPECIES FULLY PROTECTED UNDER THE CALIFORNIA FISH AND GAME CODE

Most of the state's designated fully protected species occur well outside the project vicinity, but two fully protected birds could occur in the area. These are: golden eagle (discussed above, Species Protected Under the Bald and Golden Eagle Protection Act) and American peregrine falcon.

American peregrine falcon (*Falco peregrinus*). Peregrine falcons were formerly listed under CESA and ESA, but have been delisted under both Acts. They are found irregularly in the low desert region, generally during migratory and winter seasons. They have not been known to nest in the region in recent decades, though they did nest in desert mountain ranges near the Colorado River historically (Rosenberg et al. 1991; Patten et al. 2003). They feed primarily on birds captured during flight. Waterfowl and shorebirds make up a large proportion of their prey, and nest sites are often within foraging range of large water bodies.

DHSP occurrence: There is only minimal likelihood that American peregrine falcon would be found in the project vicinity, except as brief overflight during migration. Project implementation would not affect nesting habitat and has little likelihood of adversely affecting foraging behavior.

4.5 BLM SENSITIVE SPECIES

The BLM maintains a list of Sensitive Species, including species that are rare, declining, or dependent on specialized habitats (BLM 2010). It manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing).

In addition to species addressed in this section of the BBCP, all listed threatened or endangered species (above) are managed as BLM sensitive species.

Burrowing owl (*Athene cunicularia*). The burrowing owl is a BLM Sensitive Species and a CDFG Species of Special Concern. It is a small, terrestrial owl of open country. During breeding season, it ranges throughout most of the western US. It occurs year-around in southern California, but may be more numerous during fall and winter, when migratory individuals from farther north join the regional resident population. Burrowing owls favor flat, open annual or perennial grassland or gentle slopes and sparse shrub or tree cover. They use the burrows of ground squirrels and other rodents for shelter and nesting. Availability of suitable burrows is an important habitat component. Where ground squirrel burrows are not available, the owls may use alternate burrow sites or man-made features (such as drain pipes or debris piles). In the California deserts, burrowing owls generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is 1 February through 31 August.

DHSP occurrence: During the desert tortoise surveys for the Desert Harvest project site (above), AMEC field biologists examined all suitable burrows for sign of burrowing owls. These field surveys correspond to 100 percent coverage Phase 2 surveys for burrowing owls, recommended by the CBOC protocol (1993). No burrowing owls or their sign were observed during these spring season surveys, or during the winter and breeding season avian point count surveys. However, two incidental burrowing owl observations were made by Aspen biologists during streambed delineation field work. In one observation, a burrowing owl was briefly seen perching and flying, but was not at a burrow. The other observation was a burrowing owl seen in the mouth of an inactive desert kit fox burrow; no burrowing owl sign (e.g., whitewash, prey remains, or owl pellets) was found at the site. Based on these field surveys and incidental observations, we conclude that the site is suitable habitat for burrowing owls during winter or breeding seasons. Breeding burrowing owls were not present on the site during the desert tortoise surveys, but they could nest on the site in future years. During fall and winter, the site appears to serve as low-density seasonal burrowing owl habitat.

Bendire's thrasher (*Toxostoma bendirei*). Bendire's thrasher is a BLM Sensitive Species and CDFG Species of Special Concern. California populations are migratory, though Bendire's thrasher is found year-around in more southern portions of its range, in southern Arizona and adjacent Mexico. The Desert Harvest site is near the southern boundary of its breeding range in California. It breeds in open, upland desert shrublands of JTNP and surrounding area, and northward through several disjunct regions of the Mojave Desert (Sterling 2008). Its habitat requirements are poorly understood, but it is generally associated with *Yucca* (e.g., Joshua tree) and *Opuntia* (cholla cacti) species on gently sloping terrain. Soil texture is apparently important to habitat suitability, perhaps because Bendire's thrashers largely forage on ground-dwelling insects. Hard rocky soils (e.g., desert pavement) and loose sands (e.g., dry wash sands) are apparently less suitable than firmly packed, fine-textured soils.

DHSP occurrence: Bendire's thrashers were not observed on the project site during the winter or breeding-season point-count surveys. Habitat throughout the site appears to be of marginal suitability, due to relatively low cover of *Yucca* and *Opuntia* species, and seemingly poorly-suitable soil texture. There is a low to moderate probability that Bendire's thrasher may occur on the site. Project development would eliminate 1,208 acres of marginally suitable habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments.

Lucy's warbler (*Vermivora luciae*). Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. It is a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees). Its primary nesting habitat is mesquite thickets, but also uses native riparian trees and saltcedar (*Tamarix* spp.).

DHSP occurrence: Two singing male Lucy's warblers were reported in April 2011 near the southwestern corner of the project area (AMEC 2011). These birds were not observed later during the nesting season (28 April survey date), though no focused surveys were conducted. It is unknown whether either or both of these birds successfully established breeding territories in the area, or moved on to another site. Suitable nesting cavities may be available in large blue palo verde trees on the site, but probably not in the more dominant desert ironwood trees (see Gila woodpecker discussion, above). Lucy's warblers may nest in desert wash woodlands on or near the proposed solar facility site or gen-tie alignment alternatives.

Project development would eliminate up to 180 acres of potential nesting and foraging habitat for Lucy's warbler on the proposed solar generator site, and could also affect smaller areas of suitable habitat along gen-tie alignments. In addition to habitat impacts, the project could cause mortality or injury to a Lucy's warbler (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below.

Bats. The BLM includes several bat species on its list of sensitive species. The special status bats of the local area roost in rock crevices, tunnels, or caves; one species (western yellow bat) roosts in the foliage of riparian trees. Roost sites may be used seasonally (e.g., inactive cool seasons) or daily (day roosts, used during inactive daylight hours). Maternity roosts are particularly important overall for bat life histories. Knowledge of bat distributions and occurrences is sparse. The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Pierson & Rainey 1998; Gannon 2003). Bat life histories vary widely. Some species hibernate during winter, or migrate south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. All special status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands such as found on the project site.

DHSP occurrence: Project development is unlikely to affect roost sites for most special status bats, though pallid bats could roost among small rocks on the ground and California leaf-nosed bats might roost in ironwood trees between foraging bouts (Ironwood Consulting 2010). The project would eliminate 1208 acres of desert shrubland foraging habitat, including 180 acres of productive Blue Palo Verde – Ironwood Woodland foraging habitat, and would also affect smaller areas of foraging habitat along gen-tie alignments. Desert dry wash woodland attracts foraging bats due to increased insect productivity. This is especially true for California leaf-nosed bats and pallid bats that feed on large insects they glean from the foliage. Roosts for these species have been identified in mines in the Eagle and Coxcomb Mountains, north of the DHSP site (Ironwood Consulting 2010).

4.6 OTHER SPECIAL STATUS BIRD AND BAT SPECIES

Raptors. In addition to raptors discussed above, several other special-status birds of prey are found seasonally, especially during winter, in the region. These include osprey (*Pandion haliaetus*), ferruginous hawk (*Buteo regalis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbaris*), short-eared owl (*Asio flammeus*), and long-eared owl (*A. otus*) (Table 4). Osprey and sharp-shinned hawk were observed flying over the site during winter season point count surveys, but neither species would nest in the area (AMEC 2011). Outside their breeding seasons, these raptors need not return to their nests to feed young or tend eggs. Thus, they are able to forage over wide areas, where they capture birds or small mammals. Suitable winter or migratory season foraging habitat for all of these raptors is widely available throughout the region.

DHSP occurrence: Potential project impacts to these species and their foraging habitat would be comparable to those discussed above for wintering golden eagles. In summary, project construction would eliminate 1,208 acres of suitable foraging habitat, cause increased noise and disturbance to adjacent habitat, and may present collision or electrocution hazards, such as the gen-tie line and other project facilities.

Upland perching birds. Several upland perching bird species are included in the CDFG Special Animals compilation. These include loggerhead shrike (*Lanius ludovicianus*), LeConte's thrasher (*T. lecontei*), Crissal thrasher (*T. crissale*), the Eagle Mountains scrub-jay population (*Aphelocoma californica cana*), and vermilion flycatcher (*Pyrocephalus rubinus*). In addition, a Vaux's swift (*Chaetura vauxi*) was observed over the site during migration season (AMEC 2011); this species occurs in the area only during migration; it nests well to the north, and project development would be unlikely to affect Vaux's swift.

DHSP occurrence: Loggerhead shrikes were observed on the site routinely throughout the winter and breeding season avian point count surveys (AMEC 2011). Neither LeConte's thrasher nor Crissal thrasher have been reported on-site, but habitat is suitable and either species could occur there. Project development would eliminate 1,208 acres of suitable habitat for these species at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. Vermilion flycatchers have not been reported on-site, but nest in similar habitat to the south (AMEC 2011) and could nest in ironwood woodlands on-site in future years. Project development would eliminate 180 acres of suitable desert woodland habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. The Eagle Mountains scrub-jay population resides year-around in pinyon woodlands in the Eagle Mountains. It is disjunct from other scrub-jay populations, and is on CDFG's "watch list" but has no other special conservation status. A scrub-jay was observed on the project site in October 2011; presumably, it was wandering or dispersing from habitat in the Eagle Mountains. However, this bird could have come from much farther away. Scrub-jays of the Great Basin population and can wander considerable distances. However, no suitable scrub-jay habitat is found in the project area. Other potential impacts to these species would be similar to those discussed below, under the MBTA.

5.0 RISK ASSESSMENT

This section of the BBCS describes project-specific risks that the DHSP would or could pose to birds and bats. The USFWS (2010b) recommends that the project-specific risk assessments for solar projects should address the potential for take, including lethal take, based on each of the threats described below (Sections 5.1 through 5.7).

5.1 BURNING FROM CONCENTRATED LIGHT AT SOLAR ARRAYS

As a PV solar facility, the DHSP would not concentrate light for electricity generation and would not pose a burning risk to birds or bats.

5.2 TRANSMISSION LINE, DISTRIBUTION LINE, POWER TOWER, METEOROLOGICAL TOWER, OR GUY LINE COLLISION

The project component of greatest potential concern that would pose lethal collision risk to birds or bats is the gen-tie line, during the construction, O&M, and decommissioning project phases. Smaller risks would be posed by other components, during any of the three phases. These include the above-ground distribution lines, above-ground collection lines, the meteorological station(s) and any guy-wires that may support meteorological instruments, and large equipment such as cranes that would be in use during the construction and decommissioning phases. As a PV solar facility, the project would not include a power tower.

Bird collisions with power lines generally occur when: (1) a power line or other aerial structure transects a daily flight path used by a concentration of birds, or (2) migrant birds are traveling at reduced altitudes and encounter tall structures in their path. Collision rates generally increase in low light conditions, during rain, snow, or strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Passerines (e.g., songbirds) and waterfowl (e.g., ducks) collide with wires (APLIC 2006), particularly during nocturnal migrations or poor weather conditions (Avery 1979). However, passerines and waterfowl have a lower potential for collisions than larger birds, such as raptors. Passerines and waterfowl tend to fly under power lines. Larger species generally fly above the power lines (generally heavy gauge conductors that are readily visible), but they may risk colliding with the lighter and less visible static or ground lines mounted higher on the same tower structures. Also, many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al. 1978). The magnitude of collision-caused bird mortality cannot be predicted without extensive information on bird species, abundance, and movements in the area.

The PV solar panels themselves may also pose a collision risk. Large-scale solar facilities present a relatively new and unresearched risk for bird collisions. Studies conducted at the Solar I facility, a central receiver solar power plant near Daggett, California, indicated that bird mortality consisted predominantly of collisions with mirrors (McCrary et al. 1986). To date, little is known regarding the avian response to reflection or glare from PV solar technology. The reflectivity of PV solar technology is lower than that of the mirrors (heliostats) used by thermal solar projects like the Solar I facility, however, it is possible that glare could affect birds to some degree if the panels reflected light and images, as they might be mistaken for open sky or water. Light reflecting from the panels could cause an increase in glare and Polarized Light Pollution (PLP). According to Horvath et al. (2010), PLP caused by anthropogenic structures can alter the ability of wildlife to seek out suitable habitat, detect or elude predators, or effectively navigate using natural polarized light patterns, ultimately affecting dispersal and reproduction.

enXco will construct all transmission lines and distribution lines according to APLIC guidelines (Mitigation Measure WIL-1) to minimize the risk of avian and bat collision, and to monitor bird fatality at the DHSP site to evaluate need for follow-up adaptive management measures (see Monitoring and Adaptive Management sections, below).

5.3 ELECTROCUTION POTENTIAL

The gen-tie line and above-ground collection and distribution lines may present electrocution risk to certain large birds. Large raptors including golden eagles, Swainson's hawks, ferruginous hawks, red-tailed hawks, prairie falcons, and other large aerial perching birds such as turkey vultures, are susceptible to electrocution on power lines because of their large size and proclivity to perch on tall structures. Transmission structure design is a major factor in causing or preventing raptor electrocutions. Electrocution occurs when a perching bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission structure with insufficient clearance between the conductor phases or conductors and grounds. The majority of raptor electrocutions are caused by distribution lines and relatively small transmission lines, energized at voltage levels between 1 kV and 69 kV. Higher voltage transmission lines are built with wider spacing between the conductors and grounds, and present reduced threat of electrocution. Electrocution can occur when horizontal separation is less than the wrist-to-wrist (flesh-to-flesh) distance of a bird's wingspan or where vertical separation is less than a bird's length from head-to-foot. Electrocution can also occur when birds perched side-by-side span the distance between these elements (APLIC 2006).

The largest bird that is likely to come in contact with the gen-tie line is golden eagle (wingspan to 7.5 feet; wrist-to-wrist length of 3.5 feet; height to 2.2 feet). The red-tailed hawk is the most common large bird that could come in contact with the gen-tie lines (wingspan to 4.7 feet; wrist-to-wrist length of 1.9 feet; height to 1.8 feet). Other large birds in the area are turkey vulture (5.8-foot wingspan, two-foot wrist-to-wrist length, 1.8 feet tall) and great horned owl (4.3-foot wingspan, 2.1-foot wrist-to-wrist length, 1.3 feet tall). Swainson's hawk has a 4.5 foot wing-span, and can be 1.3 feet tall (bird sizes from APLIC 2006). The Avian Powerline Interaction Committee (APLIC, 2006) guidelines recommend 60 inch separations between components to protect eagles and other birds from electrocution. The risk of electrocution would be minimized by implementation of Mitigation Measure MM WIL 1, which requires that the project Owner implement APLIC Guidelines for the gen-tie and all electrical components.

5.4 TERRITORY ABANDONMENT

Construction activities would cause most mobile vertebrate wildlife to leave the site, or attempt to leave. Animals dispersing from the site would be subject to further adverse effects, potentially including mortality. They would be at increased risk of predation as they flush from cover during site clearing. After leaving their home territories, displaced animals may be unable to find suitable food or cover in new, unfamiliar areas. They may attempt to return to their home ranges, possibly resulting in increased predation risk or other effects. Or, if they find food and other resources at new locations off site, these may be within the occupied territory of another individual of the same or similar species, resulting in competition for resources. These displacement effects would apply to common wildlife species and to special-status species.

5.5 NEST AND ROOST SITE DISTURBANCES

The entire project site and surrounding area provides suitable nesting habitat for resident and migratory bird species. Many adult birds would flee from equipment during initial vegetation clearance for project construction. However, nestlings and eggs would be vulnerable to impacts during project construction. If initial site grading or brush removal were to occur during nesting season, then it likely would destroy bird nests, including eggs or nestling birds. One special-status species, the burrowing owl, is unlikely to flee the site during construction, due to its characteristic behavior of taking cover in burrows. Potential project impacts and an avoidance and mitigation measure for burrowing owl are summarized below.

Some birds will likely nest in the project area during construction and O&M phases, even after initial grading and clearing. Depending on the species, birds may nest on the ground close to equipment; within the open metal framework of the panel support structures; on buildings, foundations, structures, or construction trailers; or on idle vehicles or construction equipment left overnight or during a long weekend. In areas where construction is phased (e.g., footings, or tower structures) birds may quickly use these features as nest sites. The species most likely to nest in the project area during construction are common ravens (*Corvus corax*), house finches (*Carpacus erythrinus)*, and mourning doves (*Zenaida macroura*), all of which are protected by the MBTA and Fish and Game Code Sections 3503 and 3513.

Mitigation Measure MM WIL-3 (Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory Birds) describes pre-construction surveys, buffer areas, and other requirements to avoid bird mortality. Due to the high probability that birds may nest on site during construction, MM WIL-3 requires regular monitoring of the work area throughout the breeding season. In some cases, it may be necessary to reduce buffer areas or to remove or relocate a bird nest in coordination with the resource agencies to proceed safely with construction.

Burrowing Owl. Burrowing owls have been observed on site during winter and migratory seasons, but not during breeding season (Section 3.4). However, the habitat on the project site is suitable, and burrowing owls could occupy the site in low numbers in future breeding seasons. Potential direct project impacts to burrowing owls would be similar to those described for nesting birds, but construction activities also could destroy occupied burrows or cause the owls to abandon burrows during any season. If owls were present, construction during the breeding season could cause nest abandonment, or the incidental loss of fertile eggs or nestlings. Mitigation Measure MM WIL-4 (Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures) would prevent take of occupied burrowing owl burrows.

Golden Eagle. The project site does not provide suitable golden eagle nesting habitat. However, the entire DHSP project area provides suitable foraging habitat, and is within several miles of golden eagle nesting territories located in the Eagle Mountains, Coxcomb Mountains, and Chuckwalla Mountains. Most of these territories were inactive in 2010 (activity, but not reproduction, was recorded at one nest site in the Coxcomb Mountains), but there have been no subsequent surveys for nesting activity. Human intrusions near golden eagle nest sites have resulted in nest abandonment; high nestling mortality when young go unattended due to altered behavior by the parent birds; premature fledging; and ejection of eggs or young from the nest (reviewed by Pagel 2010). Project activities that result in nest-site abandonment would constitute take under the Bald and Golden Eagle Protection Act (USFWS 2007).

Project construction is not expected to cause substantial direct disturbance (e.g., noise, lighting, visual disturbance) to nest sites in the local nesting territories, due to their distance from the site. Moreover, implementation of Mitigation Measure MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires annual monitoring during nesting season, and requires the project Owner to prepare and implement an adaptive management plan if golden eagles are found nesting in the area at any time during project construction.

5.6 HABITAT LOSS AND FRAGMENTATION

The term habitat refers to the environment and ecological conditions where a species is found. Wildlife habitat is generally described in terms of vegetation, though a more thorough explanation often must encompass further detail, such as availability or proximity to water; suitable nesting or denning sites; shade; foraging perches; cover sites to escape from predators; soils that are suitable for burrowing or hiding; limited noise and disturbance; and many other factors that are unique to each species. Vegetation reflects many aspects of habitat, including regional climate, physical structure, and biological productivity and food resources (for many wildlife species). Thus, vegetation is a useful overarching descriptor for habitat and it is the primary factor in this analysis of impacts to wildlife habitat. Habitat loss and fragmentation resulting from the project would be offset through habitat compensation, as required by Applicant Measure AM-1 and mitigation Measure VEG-6 (below).

Habitat loss. Project construction would result in permanent and long-term impacts to approximately 1,206 acres of natural vegetation, including 1,026 acres of Creosote Bush Scrub and 180 acres of Blue Palo Verde–Ironwood Woodland. Following construction, remaining vegetation and habitat would be unsuitable for many species, particularly species with specific habitat requirements, including most special-status wildlife species. Vegetation and habitat conditions following construction would likely remain suitable for relatively common species, such as side-blotched lizard (*Uta stansburiana*), house finch (*Carpacus erythrinus*), northern mockingbird (*Mimus polyglottos*), and desert cottontail (*Sylvilagus audubonii*).

Golden eagle. Golden eagles would be likely to forage on the DHSP site at any time of year, particularly during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges. Project construction would eliminate 1,208 acres of suitable foraging habitat from within the likely foraging ranges of 3 known territories. During years when golden eagles nest in the territories surrounding the site, the project could affect the availability of foraging habitat for the nesting pairs. This habitat loss may also affect golden eagle foraging during winter and migratory seasons, or may affect foraging by unmated golden eagles during the nesting season.

A substantial loss of foraging habitat within range of a nest site could cause reduced productivity or interfere with normal feeding behavior, though enXco does not anticipate the loss of foraging habitat on the project site and gen-tie line alignment would appreciably reduce foraging habitat availability for golden eagles using territories in the surrounding mountains. The nearest golden eagle nesting territory is in the Coxcomb Mountains, about 4 miles from the DHSP site. A circle with a radius of 4 miles comprises about a 50 square mile area; the DHSP site would affect about 4 percent of that area. Further, golden eagles forage at distances much greater than 4 miles from their nests. enXco does not believe that foraging habitat loss would constitute disturbance to golden eagles (pursuant to USFWS 2007), and would not cause decrease in productivity, or substantially interfere with normal breeding, feeding, or sheltering behavior. Moreover, Mitigation Measure MM VEG-6, would require compensatory land acquisition to offset project-specific loss of foraging habitat.

Gila Woodpecker. Gila woodpecker (*Melanerpes uropygialis*) was observed within the project area during December 2010, but was not observed during the subsequent winter or spring point counts. Blue

Palo Verde–Ironwood Woodland vegetation on the site may provide marginally suitable Gila woodpecker nesting habitat, and there is a low possibility that it may nest on the site, or that the project site is near an occupied nesting territory. Project impacts to habitat can be offset through implementation of MM VEG 6 (below), which requires compensation for impacts to Blue Palo Verde–Ironwood Woodland at a ratio of 3:1.

Habitat fragmentation. Wildlife, including birds and bats, are often restricted to specific habitat types or elevations. Their habitats may be contiguous over extensive areas, or they may be scattered in patches in a landscape. For species with patchy distributions, dispersal between habitat patches may be important in colonizing (or recolonizing) areas or in supplementing demography or genetic makeup in isolated populations. Increasingly, land use planners designate wildlife dispersal corridors among open space areas to maintain movement routes for wildlife populations among the larger habitat areas. Public discussion of movement corridors tends to focus on uncommon, large, wide-ranging mammals, particularly mountain lions. But wildlife corridors also are intended to enable dispersal for other species, including small mammals, birds, amphibians, reptiles, and plants.

Beier and Lowe (1992) proposed a method for evaluating potential corridors, characterizing species as “corridor passage” and “corridor dwellers” depending on whether they would likely traverse the corridor during a single event (e.g., a mountain lion crossing from one mountain range to the other) or over a generation or longer (e.g., a population of pocket mice living within the corridor, with individual mice moving relatively short distances over time, but eventually colonizing new areas). Dispersal mechanisms relevant to birds and habitat fragmentation in the upper Chuckwalla Valley can be divided into three categories, partly analogous to Beier and Lowe’s “corridor passage” and “corridor dweller” categories.

1. Species dispersing short-distances, over the course of days, weeks, or longer. This category could include non-migratory birds whose behavior or anatomy limits their flight patterns to relatively short distances. They would move on the ground or via short flights, among shrubs in contiguous or nearly-contiguous habitat areas. While almost all birds are capable of flying long distances at times (e.g., during juvenile dispersal), behavior patterns of many species prevent them from moving across unsuitable habitat blocks. This effect is especially well-known among non-migratory shrubland species of coastal southern California (Soule et al. 1988). The project would not present an absolute barrier to movement, but it could reduce movement throughout the area for resident shrubland species, possibly including loggerhead shrike, Crissal thrasher, Le Conte’s thrasher, or Gila woodpecker. Any of these species would be likely to disperse around, but not across, the project site. However, dispersal probably would take place over a period of time rather than during a single event. These species are comparable to Beier and Loe’s “corridor dweller” category.

2. Species dispersing by longer-distance mechanisms. This category could include migratory birds or wide-ranging non-migrants routinely flying long distances within or among habitat patches. Examples include most raptors, common raven, and migratory passarines such as Lucy’s warbler and Bendire’s thrasher. The project’s effects on habitat fragmentation would be relatively unimportant for these species.

Equivalency analysis. The applicant, enXco, is working with Wildlands, Inc., a private firm specializing in habit preservation and management, to identify and acquire suitable compensation lands to mitigate the project’s potential impacts to regional wildlife movement. The equivalency analysis will be incorporated into the project’s Habitat Compensation Plan and the final Bird and Bat Conservation

Strategy. Mitigation Measure VEG-6 (below) specifies selection criteria to ensure that compensation habitat adequately offsets the project's impacts to habitat and fragmentation.

5.7 DISTURBANCE DUE TO ONGOING HUMAN PRESENCE AT THE FACILITY

Maximum noise levels during construction are estimated to range from 74.8 to 83.2 dBA at 100 feet from construction activity, and would decrease with distance away from activity. This would be a substantial increase over existing background noise levels near the solar field site, which are expected to be low, with typical daytime noise levels of 35 to 50 dBA. In addition, if construction activities were to occur at night, lighting would be required. Noise and lighting during construction would affect wildlife in adjacent habitats by disrupting foraging, breeding, sheltering, and other activities; or it cause animals to avoid otherwise suitable habitat surrounding the site. The effects of construction noise include annoyance, which causes birds and other wildlife to abandon nests or dens; increased stress hormone levels, interference with sleep and other activities; and interference with acoustic communication by masking important sounds or sound components, such as territorial calls, contact calls, or alarm calls (Dooling and Popper, 2007). Many species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could disturb nesting birds and other wildlife and adversely affect nesting and other activities.

Lighting during project construction may affect nocturnal wildlife species. Lighting can affect behavior and physiology, and may also increase the risk of predation of wildlife because they may be more detectable to nocturnal predators. Lighting would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats, discussed further below. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) and MM VR-6 (Night Lighting Control) would minimize the impacts of noise and lighting by ensuring lighting is focused only on work areas and does not unnecessarily extend beyond work areas, and scheduling noisy construction activities near the project site perimeter outside the most sensitive season.

During operation, some birds and other small wildlife species would re-occupy the solar field site once construction activities are completed, where ongoing O&M noise and lighting may affect them. Noise and lighting may also affect wildlife in the nearby off-site habitat. These effects would be qualitatively similar to the description of construction phase effects of noise and lighting, but would be of lesser magnitude. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) would minimize these impacts.

5.8 ADDITIONAL RISK FACTORS

Storage ponds. During construction, storage ponds on the site would be used to store water for dust control. These ponds would be within the fenced construction area. Even though they would be fenced, they will be likely to attract birds, including ravens, and thus act as a "subsidy" (see discussion below). Storage ponds would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats.

Evaporation ponds. The proposed evaporation ponds could affect birds by posing a drowning hazard; a water subsidy for predators; salt encrustations, which can interfere with flight or other activity; or salt toxicosis (poisoning). Mitigation Measure MM WIL-1 requires covering the evaporation pond to prevent these impacts. If the evaporation pond dries completely at times, residual salts could become airborne and cause dust or health impacts to wildlife in surrounding habitat. Mitigation Measure MM WIL-1 would minimize this effect by ensuring that salt sediment is promptly removed at regular intervals from the evaporation pond.

Predator subsidies. Project construction, operation, and decommissioning activities could provide resources in the form of trash, litter, or water, which attract and subsidize unnaturally high numbers of predators such as common ravens, coyotes, and feral dogs. This influx of predators could cause unnaturally high predation pressure on wildlife species in the vicinity. Ravens are opportunistic omnivores and they prey on the eggs and nestlings of native birds, among many other food sources (Zeiner et al. 1990), including juvenile desert tortoises. Ravens and coyotes habituate to human activities and are subsidized by food (trash, road killed animals), water (irrigation or dust control overspray), and (for ravens) new perching, roosting, and nesting sites (transmission line structures and other structures) that are introduced or augmented by human encroachment.

Mitigation Measure WIL-8 (Raven Monitoring, Management, and Control Plan) would require management of all potential predator subsidies, monitoring of raven presence and abundance, control measures as needed, and contribution to the region-wide Raven Management Program.

5.9 CUMULATIVE IMPACTS

The development of numerous large-scale renewable energy projects, including the DHSP and other solar and wind projects in the region, would result in a substantial permanent conversion of desert habitat to industrial and commercial uses. Existing and foreseeable future projects in the NECO planning area (not including the DHSP) would result in the total projected loss of 4.5 percent of the Sonoran Creosote Bush Scrub and 6.5 percent of the Desert Dry Wash Woodland habitat in the NECO planning area (see DEIS Section 4.3.14). This would constitute a substantial cumulative impact to these plant communities and wildlife habitat through direct habitat loss and habitat fragmentation. The DHSP would contribute approximately 0.4 percent to this cumulative impact to Sonoran Creosote Bush Scrub and between 0.9 and 1.2 percent to the cumulative impact to Desert Dry Wash Woodland. The DHSP DEIS concludes that the project would contribute considerably to cumulative impacts to wildlife habitat.

Common Wildlife. The DHSP's incremental contribution to cumulative impacts to common wildlife, including most resident and migratory birds, would be habitat loss and fragmentation. Most common wildlife species range widely over California, and these species have not been identified as conservation priorities. The DHSP would contribute incrementally to impacts to common wildlife such as disruption of movement, disturbance, mortality, loss of habitat, and fragmentation. With the incorporation of recommended mitigation measures, this incremental contribution would be mitigated to the extent feasible and would not result in the loss of a population or a trend toward federal or state listing for any common wildlife species. With incorporated mitigation, the DHSP would not make a considerable contribution to the cumulative regional impacts to common wildlife, when combined with the effects of past and future projects in the NECO planning area.

Golden Eagle. The DHSP would contribute to the cumulative regional loss of golden eagle foraging habitat. Other renewable developments, both existing and proposed, in the NECO planning area would have similar impacts. Cumulatively, development in the California deserts could have substantial impacts to golden eagle foraging habitat if left unmitigated. Most projects are not likely to directly affect golden eagle nesting sites in the desert mountain ranges. Implementation of DHSP mitigation measures would minimize or offset project impacts to golden eagle foraging habitat. Mitigation Measure MM VEG-6, which would require compensatory land acquisition, would offset project-specific loss of foraging habitat. Mitigation Measures MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires pre-construction and construction phase surveys to ensure that project construction activities do not result in injury or disturbance to golden eagles. Implementation of these measures would substantially reduce the Proposed Action's contribution to cumulative impacts to golden eagles.

Burrowing Owl. The DHSP would contribute incrementally to the cumulative loss of burrowing owl wintering and breeding habitat. Habitat on site and along most of the gen-tie alternative alignments appears suitable for nesting and wintering. Impacts of the DHSP would be similar to other solar developments in the region, and could include loss of breeding or wintering habitat, disturbance due to human activities, and destruction of active (nesting or wintering) burrows. However, due to the low level of use, and an apparent rarity of breeding on-site, the incremental contribution of the Proposed Action or Alternatives to cumulative impacts to burrowing owls would be minor. Implementation of mitigation measures would reduce the DHSP's contribution to cumulative impacts.

Other Special-Status Birds. The DHSP would contribute incrementally to the cumulative loss of habitat for several special-status birds. The DHSP's primary impacts to resident and migratory birds include habitat loss, disturbance to foraging and breeding, and risk of injury or mortality due to collision with project features. However, due to the availability of similar habitat in the greater Chuckwalla Valley and beyond, the DHSP's incremental contribution to cumulative impacts to resident and migratory birds would be low. This contribution would be further reduced by the implementation of mitigation measures (below).

Special-Status Bats. Bats may forage over the project area, and may be drawn to the area by the storage ponds (during construction) or the evaporation pond (during O&M). Due to the lack of extensive or high-quality roosting habitat in or near the project area, and the widespread availability of similar foraging habitat in the Chuckwalla Valley and beyond, the incremental contribution of the Proposed Action to cumulative impacts to bats would be minor. This contribution would be further reduced or offset by the implementation of mitigation measures described below.

6.0 CONSERVATION MEASURES

enXco has provided several measures as part of the project description to reduce potential impacts to biological resources, including birds and bats. These measures have been adopted into the project DEIS by incorporating them into project-specific mitigation measures proposed in Sections 4.3 and 4.4. Additional mitigation measures proposed in the DEIS encompass the substance and intent of the applicant-proposed measures, but clarify or expand on reporting requirements, timing of implementation, or other details where appropriate. Where there is a conflict between provisions of the applicant's proposed measures and the DEIS's recommended mitigation measures, the DEIS mitigation measures take precedence.

6.1 APPLICANT PROPOSED MEASURES

Applicant-proposed measures identified by enXco to reduce impacts to biological resources include the following:

AM-BIO 1: Habitat Compensation Plan. A Habitat Compensation Plan is being prepared and will be implemented by the Applicant to compensate for the loss of creosote desert scrub, desert dry wash woodland, and jurisdictional resources. Compensation will be accomplished by acquisition of mitigation land or conservation easements or by providing funding for specific land acquisition, endowment, restoration, and management actions under one of several programs, such as the recently approved mitigation program created by AB 13. The Habitat Compensation Plan will be reviewed and approved by BLM, United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). The precise details of the mitigation, including mitigation ratios, will be established in the BLM Right-of-Way (ROW) grant, USFWS Biological Opinion, and any CDFG 2081 Incidental Take Permit or CDFG 2080.1 Consistency Determination.

AM-BIO 2: Integrated Weed Management Plan. A Draft Integrated Weed Management Plan (IWMP) will be prepared pursuant to BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007) and the National Invasive Species Management Plan (NISC, 2008), and will be implemented by the Applicant to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the project. The draft plan will be reviewed and approved by the BLM.

AM-BIO 4: Worker Environmental Awareness Program (WEAP). The Applicant will implement a WEAP to educate on-site workers about sensitive environmental issues associated with the project. The WEAP will be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The program will be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. BLM will be responsible for ensuring that each construction worker at the site, throughout the duration of construction activities, receives the above training.

AM-BIO 5: Vegetation Resources Management Plan. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components:

- A Vegetation Salvage Plan which discusses the methods that will be used to transplant cacti present within the project locations following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur in the project locations if feasible.
- A Restoration Plan which discusses the methods that will be used to restore creosote bush scrub and desert dry wash woodland habitat that is temporarily disturbed by construction activities.
- The Vegetation Salvage Plan and Restoration Plan will specify success criteria and performance standards. BLM will be responsible for reviewing and approving the plan and for ensuring that the Applicant implements the plan including maintenance and monitoring required in the plan.

AM-BIO 7: Regional Raven Management Program. The Applicant shall contribute to the USFWS Regional Raven Management Program by making a one-time payment of $105 per acre of project disturbance to the National Fish and Wildlife Federation Renewable Energy Action Team raven control account. A Draft Avian and Bat Protection Plan will be prepared and will be implemented by the Applicant to specify necessary actions to be taken to protect nesting bird and bat species, including burrowing owls, nesting birds, and roosting bats. The Draft Plan will be reviewed and approved by BLM. The Final Plan will conform to the 2010 USFWS avian and bat guidelines entitled Considerations for Avian and Bat Protection Plans U.S. Fish and Wildlife Service White Paper.

AM-BIO 8: Construction Water Storage Pond Design. The temporary construction water ponds shall be designed, constructed, and operated in compliance with all applicable regulatory requirements with respect to design, operation, and maintenance, protection of migratory waterfowl, and raven management.

6.2 DEIS MITIGATION MEASURES

The DHSP DEIS will recommend additional mitigation measures to expand upon applicant's proposed measures above. The full text of each measure may be found in Sections 4.3 and 4.4 of the DEIS. The measures that relate to bird and bat conservation are listed and briefly summarized below.

MM VEG-1: Assign a Designated Biologist and Biological Monitors. The project owner will identify a Designated Biologist throughout the construction, O&M, and post-project decommissioning phases, and any subsequent monitoring/reporting period. MM VEG-1 describes the Designated Biologist's required qualifications, and responsibilities for monitoring, inspection, and reporting. The Designated Biologist also will be responsible for training and supervising Biological Monitors, who will be appointed as needed for the construction, O&M, and decommissioning phases of the project. The Designated Biologist will be the primary point of contact for resource agency communications.

MM VEG-2: Conduct Biological Monitoring and Reporting during Project Construction, Operations, and Decommissioning. The Designated Biologist and Biological Monitors shall ensure that construction activities are consistent with the adopted mitigation measures, and avoid disturbance to any habitat outside permitted work areas. The Designated Biologist shall have the authority and responsibility to immediately halt any project activities that are not in compliance with mitigation measures, or to order any reasonable measure to avoid take of a listed species.

The project Owner shall be responsible for ensuring that construction monitoring is conducted during all project phases. During the O&M phase, the reporting schedule will be quarterly rather than monthly. The Designated Biologist will report all special-status species observations to the CNDDB and include copes of these reports in monthly or quarterly monitoring reports.

MM VEG-3: Prepare and Implement a Worker Environmental Awareness Program (WEAP). The project owner shall prepare and implement a project-specific WEAP to be administered to all on-site personnel. The WEAP shall address conservation and protection requirements for biological resources.

MM VEG-4: Minimize Construction-Related Impacts. Project design shall minimize temporary construction work areas to the extent feasible and minimize the impacts to native vegetation and habitat.

MM VEG-5: Prepare and Implement a Vegetation Resources Management Plan. The Vegetation Resources Management Plan shall detail the methods for revegetation of temporarily impacted sites; salvage of cacti and special-status plants from the project footprint; and long-term management of vegetation within the solar facility during its operations.

MM VEG-6: Provide Off-Site Compensation for Impacts to Vegetation and Habitat. This mitigation measure provides further detail and specificity to the habitat compensation requirements described in AM-BIO-1. The measure includes compensation ratios for vegetation types and land use designations, ranging from 1:1 for upland creosote bush scrub, to 5:1 for lands within designated DWMAs, WHMAs, or desert tortoise critical habitat. The measure also specifies selection criteria, to address habitat values and biological connectivity. The compensation lands must be protected and managed in perpetuity for biological resource values, and the project owner must provide funding as described in MM VEG-6 for this long-term management.

MM WIL-1: Wildlife Impact Avoidance and Minimization. MM WIL-1 requires a variety of measures to avoid or minimize impacts to wildlife and habitat, including minimization of disturbance areas; roads; vehicle traffic; soil erosion; dust. It also requires avoidance of wildlife pitfalls or other potential entrapments; avoidance of toxic materials on unpaved road surfaces; minimization of standing water and other potential predator subsidies; and covering the evaporation ponds.

MM WIL-3: Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory and Nesting Birds. Pre-construction nest surveys for nesting birds shall be conducted prior to any construction activities that will occur during the breeding period (from February 1 through August 31). Additional specifications include:

- Coverage area to include the project site or other work areas and a 500-foot buffer;
- At least two pre-construction surveys, separated by a minimum 10-day interval; the second survey to be no more than 10 days before construction starts. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area;
- Reporting on survey results prior to start of construction;
- A 330-foot radius buffer zone surrounding the nests where no impacts to soils or vegetation will be permitted while the nest remains active. For any active raptor nests or bat maternity roosts, the flagged buffer zone/avoidance area shall be a 1200-foot radius surrounding the nest or roost site. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with BLM, Riverside County, CDFG, and USFWS;
- Monitoring of any active nests within or adjacent to the work areas; until nestlings have fledged and dispersed. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made;
- Ongoing breeding-season monitoring of work areas, throughout the construction, O&M, and decommissioning phases of the project; and
- Reporting on nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports described in MM VEG-2.

MM WIL-4: Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures. This measure requires pre-construction surveys for burrowing owls; avoidance measures to and buffer areas surrounding active burrows; compensation of 19.5 acres of land for each burrowing owl or breeding pair that is displaced by construction (may be "nested" within compensation lands, per MM VEG-6); and passive relocation of burrowing owls, outside the nesting season only.

MM WIL-5: Golden Eagle Pre-construction and Construction Phase Surveys. The project owner shall contract with a qualified ornithologist to conduct winter season and nesting season surveys of golden eagle habitat use in Chuckwalla Valley and surrounding mountains within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12, continuing throughout the construction phase of the project. Survey methods for the inventory shall be either ground-based or helicopter-based, as described in the *Golden Eagle Technical Guidance* (Pagel et al., 2010) or more current guidance from the USFWS. If an occupied nest is detected within 10 miles of the project site or gen-tie line alignment, the project Owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that project construction activities do not result in injury or disturbance to golden eagles. The Monitoring and Management Plan shall include a description of adaptive management actions, to include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

MM WIL-6: Bird and Bat Conservation Plan. This measure requires that the project owner prepare and implement a Bird and Bat Conservation Strategy (formerly titled Avian and Bat Protection Plan) in consultation with the USFWS. This Draft BBCS was prepared in anticipation of MM WIL-6, to conform to the recommendations of the USFWS (2010b).

7.0 MONITORING AND REPORTING

7.1 BIRD AND BAT MONITORING REQUIREMENTS OF THE DEIS

Several of the mitigation measures summarized above specify monitoring and reporting requirements. The appointed Designated Biologist will be responsible for monitoring and reporting on biological resources for project activities, beginning during pre-construction surveys and continuing through the construction, O&M, and decommissioning project phases. Specific monitoring requirements related to bird and bat conservation are the following:

MM VEG-2. The Designated Biologists will report all special-status species observations to the CNDDB and include scopes of these reports in monthly or quarterly monitoring reports, and immediately report any dead or injured listed threatened or endangered species to the Wildlife Agencies.

MM WIL-3. The Designated Biologist or Biological Monitor shall monitor bird nests located during pre-construction surveys until nestlings have fledged and dispersed; shall monitor work areas, including active work areas, throughout the breeding season each year, throughout the construction, O&M, and decommissioning phases of the project; and nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports.

MM WIL-4. If burrowing owls are passively relocated, the relocation plan will include a monitoring and reporting component.

MM WIL-5. Annual monitoring of breeding season and winter season golden eagle activity within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12 and continuing throughout the construction phase of the project. The intent of this monitoring will be to expand the existing baseline data and document local golden eagle activity during throughout the period when construction activity may affect nesting or wintering golden eagle behavior. MM WIL-5 also requires monitoring and adaptive management if an occupied nest is detected within 10 miles of the project site or gen-tie line alignment.

7.2 DESERT HARVEST BIRD AND BAT MONITORING APPROACH AND STRATEGY

enXco will implement avian and bat monitoring programs consistent with the mitigation measures, summarized above, as follows:

Construction and decommissioning phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a nest monitoring plan for any bird nests within the project footprint or the surrounding 500 foot buffer area, during nesting seasons during the construction or decommissioning phases of the project. For burrowing owls, the monitoring plan will apply to active burrows year-around during the construction or decommissioning phases. enXco will document the results of nest and burrow monitoring, including the locations and species of all nests located during field surveys, any buffer areas or other protection measures taken for each nest, and the outcome for each nest (e.g., nest abandonment, predation, or date of fledging). These results will be compiled in regular monitoring reports and provided to the USFWS.

O&M phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird nesting activity within the project area or on the gen-tie alignment during the O&M phase of the project. The purpose of the nest monitoring will be to determine which species (if any) use the project facility for nesting, which specific structures (e.g., support framework beneath PV panels, other structures on the site, or open ground among panels) are used as nest sites, and whether the project components attract birds to unsuitable or hazardous nest sites.

O&M phase mortality monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird and bat mortality within the project site. Examples of potential bird or bat hazards include, but are not limited to, striking the PV panels or other project components, and entanglement in netting at the evaporation pond.

Golden eagle activity. The USFWS has recommended that enXco obtain 3 years of nesting season and winter season golden eagle activity data for a 10-mile radius area surrounding the project site. To date, enXco has obtained 2010 breeding season data in the area from the Desert Sunlight EIS (BLM 2011b) and supporting documents. No winter or breeding season data on golden eagle activity were collected in the area during 2011. The Desert Sunlight project owner is required by Mitigation Measure WIL-6 of the Desert Sunlight FEIS, to obtain breeding season golden eagle activity over the same area each year throughout the active construction phase for that project. These data sets will provide breeding season golden eagle activity for the 2012 and 2013 breeding season throughout the recommended 10-mile radius surrounding the DHSP site.

enXco will contract with a qualified golden eagle biologist to conduct winter season surveys for golden eagle activity in a 10-mile radius of the Desert Harvest project site. Surveys will begin in December 2011 and continue over an 8-week period. During each survey all accessible roads in the study area will be traveled via automobile, with random stops to check the horizon for eagles with binoculars and high powered scopes. All transmission line towers and pole lines in the study area will also checked on each survey, as well as all historic cliff nest territories.

These surveys, in combination with the Desert Sunlight nesting season data from 2010 and 2012 will serve as the baseline golden eagle data for both projects. enXco anticipates that project construction, and construction-phase golden eagle activity monitoring, will be underway by winter 2012. At that point, continued monitoring will be implemented, consistent with the requirements of Mitigation Measure WIL-5.

enXco confirms its commitment to conduct a winter non-nesting survey in 2011-2012. Beyond that, enXco understands there to be four projects in the Chuckwalla Valley that are studying essentially the same foraging and nesting area for golden eagles. The Desert Sunlight project must conduct two additional breeding-season surveys, for example, and the eastern portions of those surveys overlap with the Palen project's golden eagle surveys. enXco will coordinate with the USFWS to assess golden eagle occurrence throughout the area, and to evaluate effects of the DHSP. Future surveys will be scheduled to avoid duplication of effort and to minimize disturbance to golden eagles.

8.0 ADAPTIVE MANAGEMENT

enXco will implement adaptive management measures during the O&M project phase as appropriate to minimize risks to birds and bats. There is no available baseline data regarding bird or bat mortality at industrial scale PV solar plants in the California desert. enXco will coordinate with USFWS, BLM, and CDFG to review the project's monitoring data and establish thresholds for implementation of adaptive management measures.

The primary potential for risk to birds and bats during project O&M are likely to be mortality or injury by striking PV panels, and nest failure that may result if nests are built on project components (e.g., PV panel support structures) that become vulnerable to disturbance during maintenance or other project activities.

Examples of potential adaptive management measures that may be taken include the following:

- Installation of visual screening on the perimeter fence, to minimize that likelihood that shrubland birds and bats would be attracted into the facility;
- Modifications to support structures or other facilities to exclude nesting birds (e.g., netting or shielding around framework; capping open pipes or tubing);
- Seasonal modifications to panel washing and maintenance schedules, or pre-washing inspections, to prevent damage to bird nests; or
- Visual or auditory deterrents to prevent birds or bats from accessing evaporation ponds or netting over the ponds.

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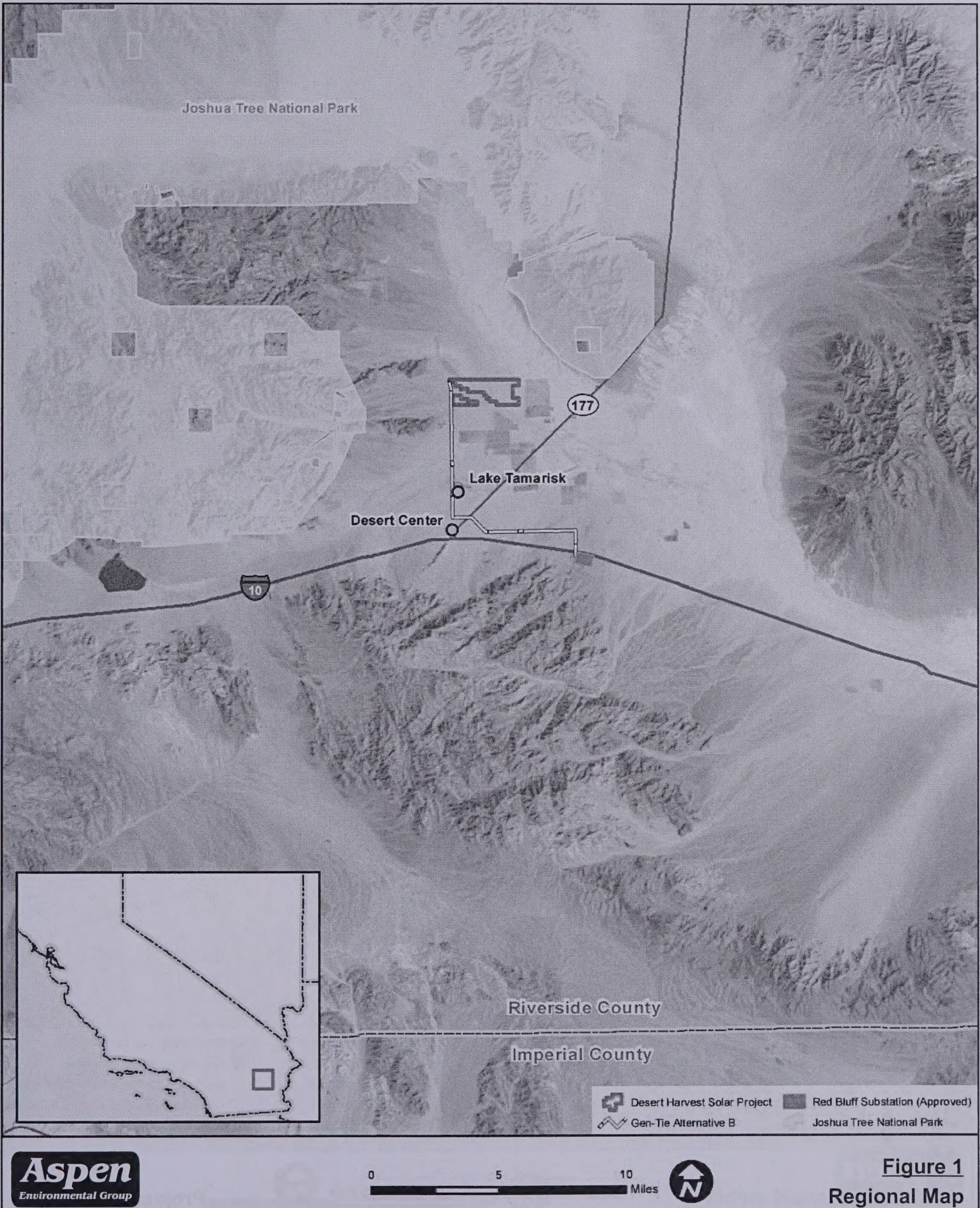
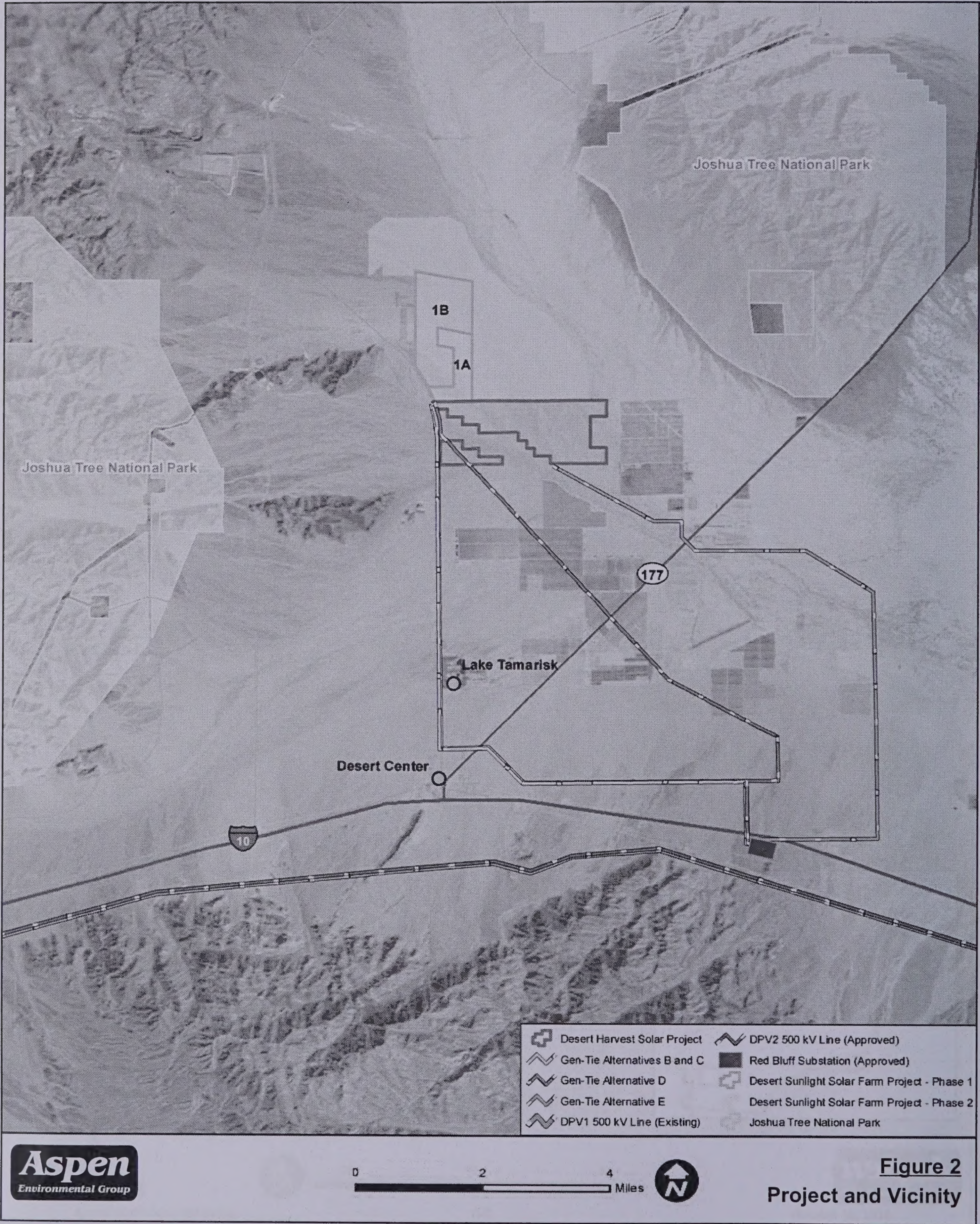

Joshua Tree National Park
177
Lake Tamarisk
Desert Center
10
Riverside County
Imperial County
Desert Harvest Solar Project
Gen-Tie Alternative B
Red Bluff Substation (Approved)
Joshua Tree National Park
0
5
10
Miles
N

Aspen Environmental Group

Figure 1
Regional Map


Joshua Tree National Park
1B
1A
Joshua Tree National Park
177
Lake Tamarisk
Desert Center
10
Desert Harvest Solar Project
Gen-Tie Alternatives B and C
Gen-Tie Alternative D
Gen-Tie Alternative E
DPV1 500 kV Line (Existing)
DPV2 500 kV Line (Approved)
Red Bluff Substation (Approved)
Desert Sunlight Solar Farm Project - Phase 1
Desert Sunlight Solar Farm Project - Phase 2
Joshua Tree National Park
Aspen
Environmental Group
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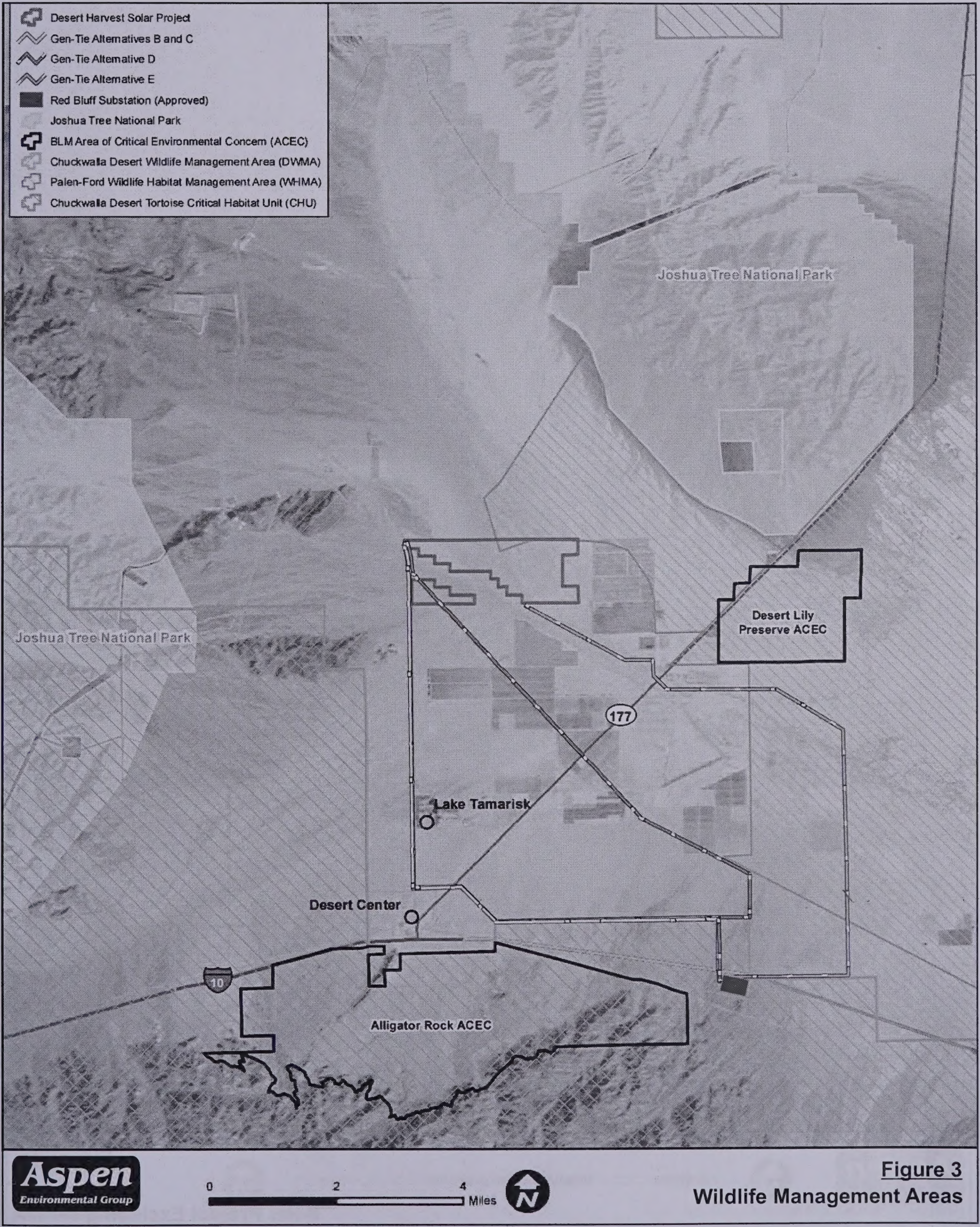
2
4
Miles
N

Figure 2
Project and Vicinity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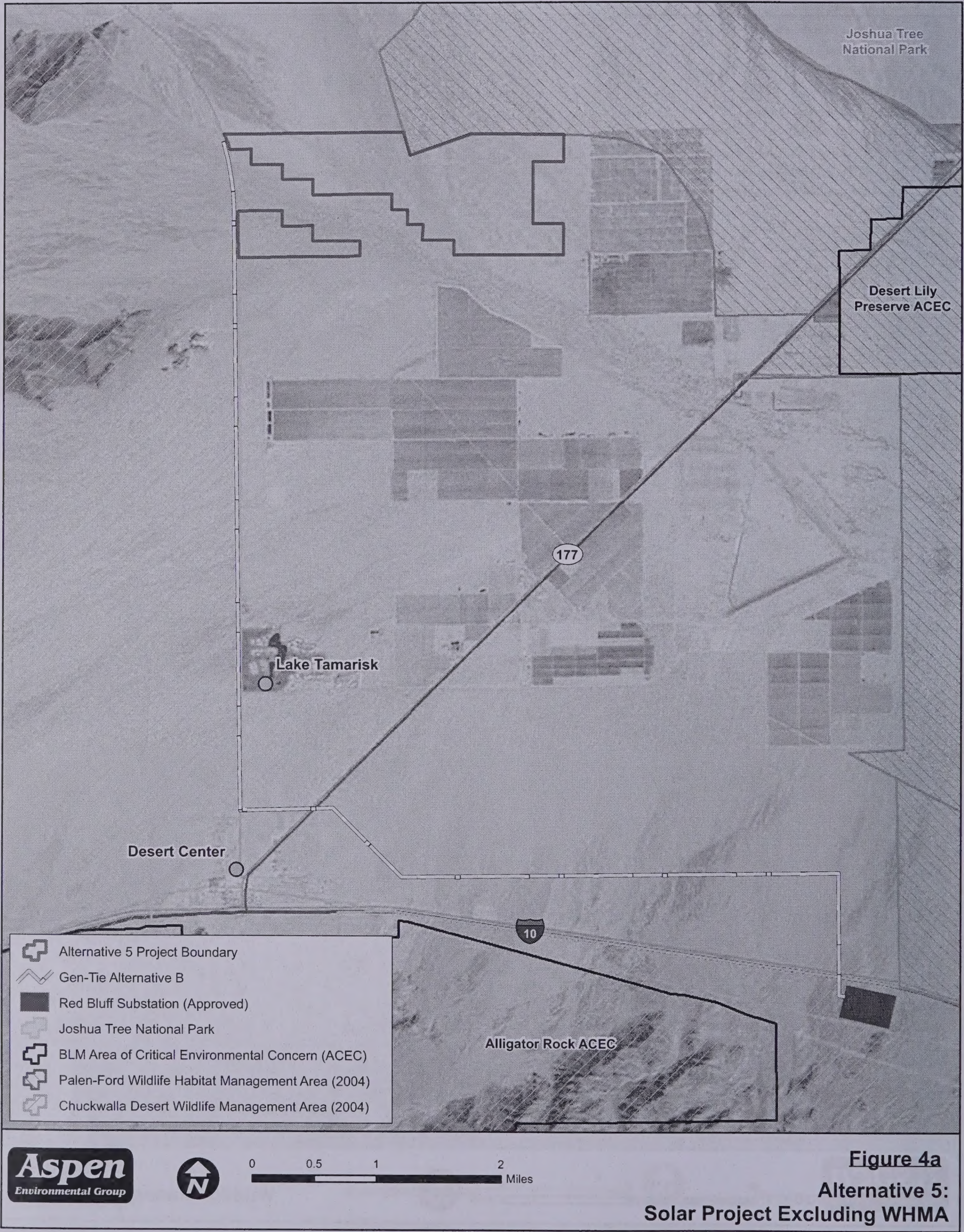
Gen-Tie Alternatives B and C
Gen-Tie Alternative D
Gen-Tie Alternative E
Red Bluff Substation (Approved)
Joshua Tree National Park
BLM Area of Critical Environmental Concern (ACEC)
Chuckwalla Desert Wildlife Management Area (DWMA)
Palen-Ford Wildlife Habitat Management Area (WHMA)
Chuckwalla Desert Tortoise Critical Habitat Unit (CHU)
Joshua Tree National Park
Joshua Tree National Park
Desert Lily Preserve ACEC
177
Lake Tamarisk
Desert Center
10
Alligator Rock ACEC
Aspen Environmental Group
0
2
4
Miles
N

Figure 3
Wildlife Management Areas


Joshua Tree National Park
Desert Lily Preserve ACEC
177
Lake Tamarisk
Desert Center
10
Alligator Rock ACEC
Alternative 5 Project Boundary
Gen-Tie Alternative B
Red Bluff Substation (Approved)
Joshua Tree National Park
BLM Area of Critical Environmental Concern (ACEC)
Palen-Ford Wildlife Habitat Management Area (2004)
Chuckwalla Desert Wildlife Management Area (2004)
Aspen Environmental Group
N
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1
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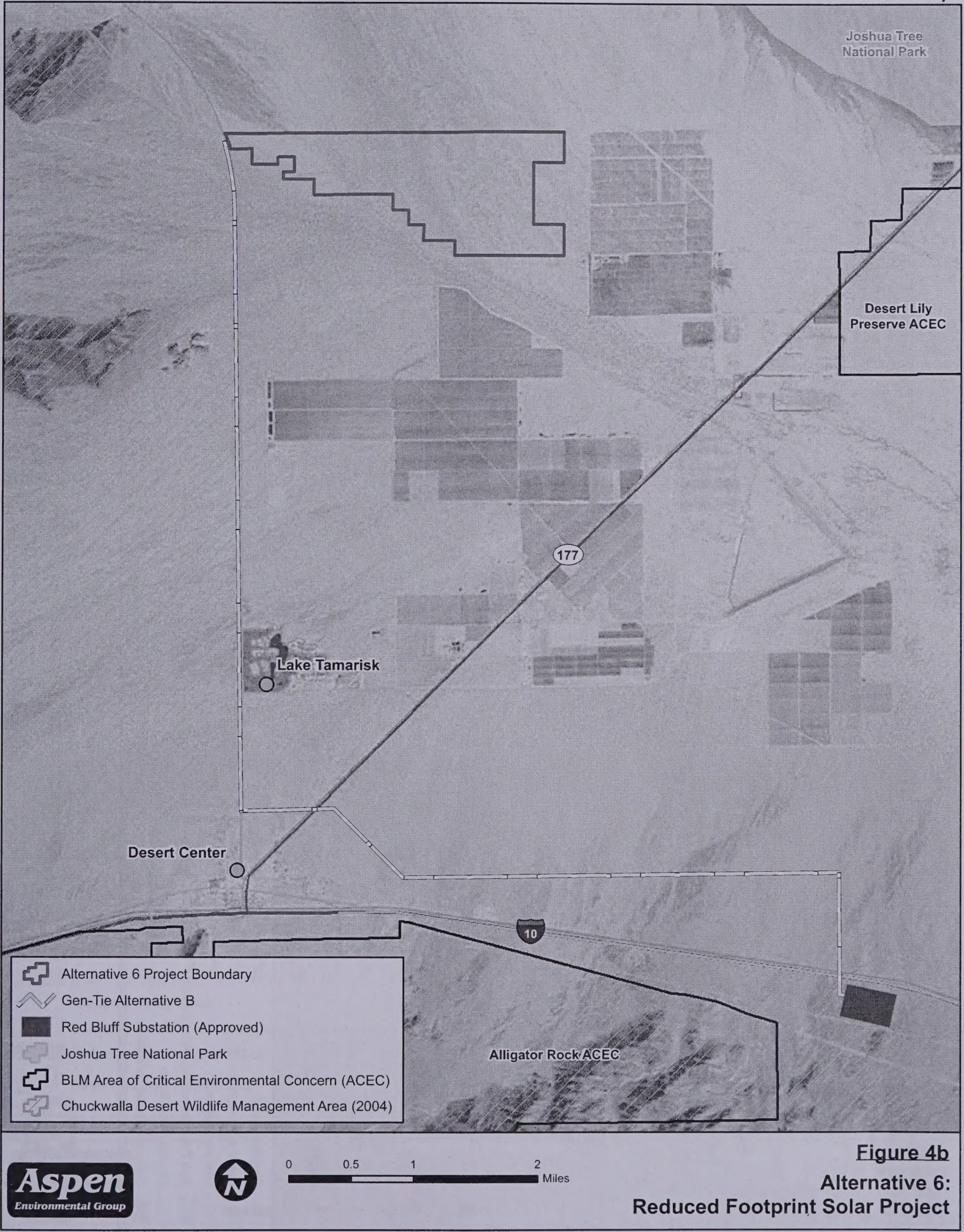
Figure 4a

Alternative 5:
Solar Project Excluding WHMA

January 2012


Joshua Tree National Park
Desert Lily Preserve ACEC
177
Lake Tamarisk
Desert Center
10
Alligator Rock ACEC
Alternative 6 Project Boundary
Gen-Tie Alternative B
Red Bluff Substation (Approved)
Joshua Tree National Park
BLM Area of Critical Environmental Concern (ACEC)
Chuckwalla Desert Wildlife Management Area (2004)
Aspen Environmental Group
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0.5
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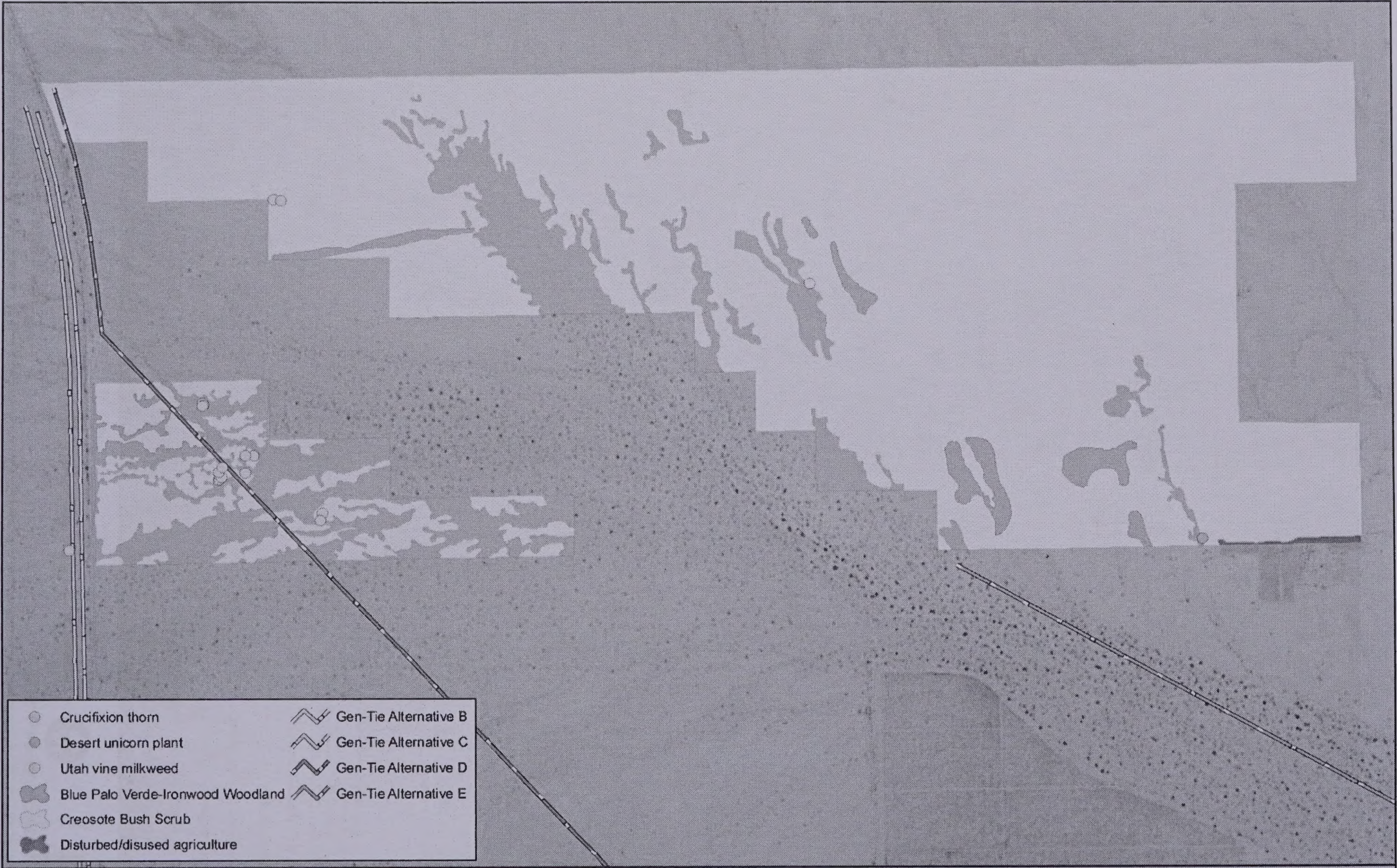
2
Miles

Figure 4b

Alternative 6: Reduced Footprint Solar Project



Aspen
Environmental Group

Figure 5

Vegetation and Special Status Plant Locations: DHSP site

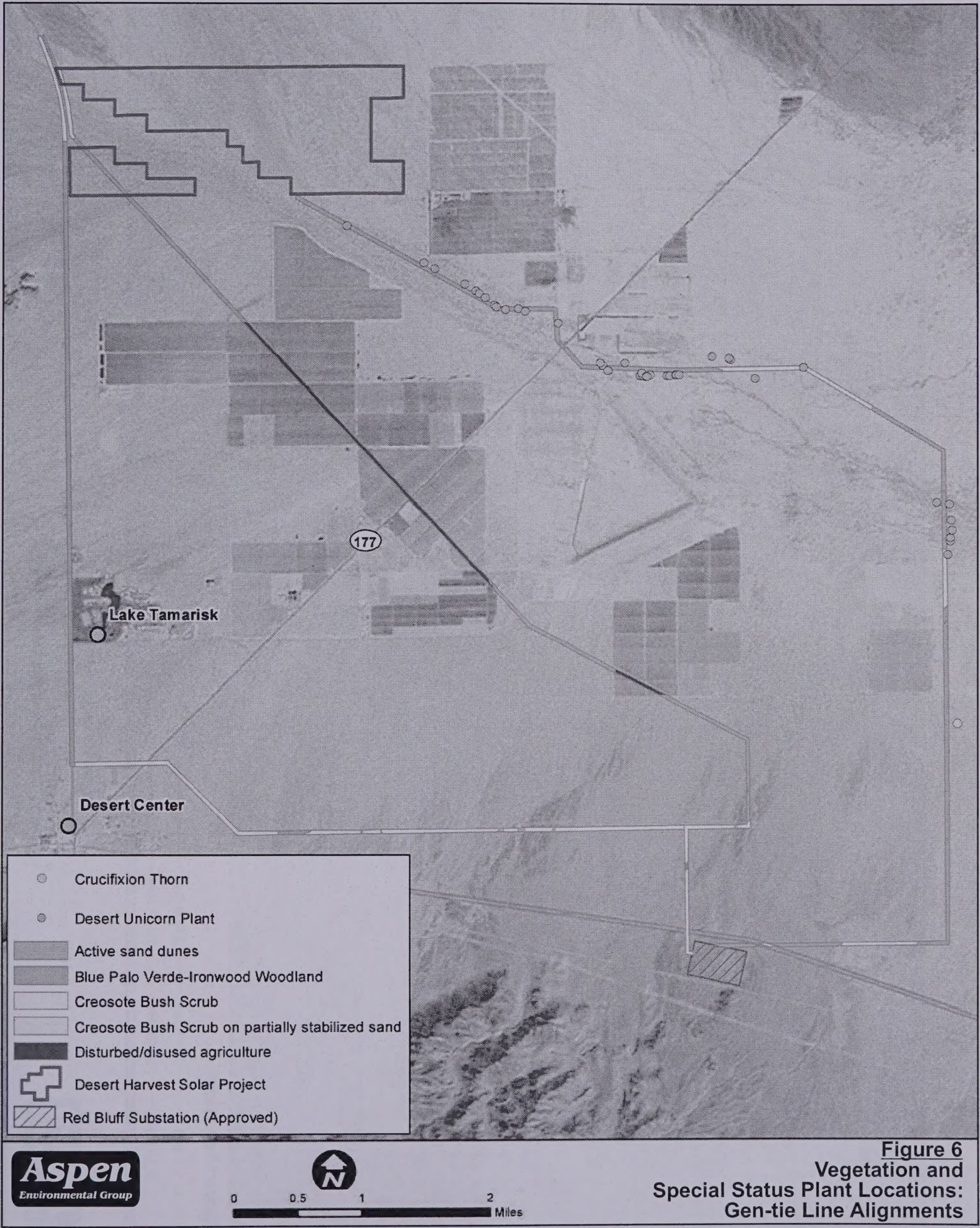

177
Lake Tamarisk
Desert Center
○ Crucifixion Thorn
● Desert Unicorn Plant
▨ Active sand dunes
▨ Blue Palo Verde-Ironwood Woodland
☐ Creosote Bush Scrub
☐ Creosote Bush Scrub on partially stabilized sand
■ Disturbed/disused agriculture
Desert Harvest Solar Project
▨ Red Bluff Substation (Approved)
Aspen Environmental Group
N
0 0.5 1 2 Miles

Figure 6
Vegetation and Special Status Plant Locations: Gen-tie Line Alignments

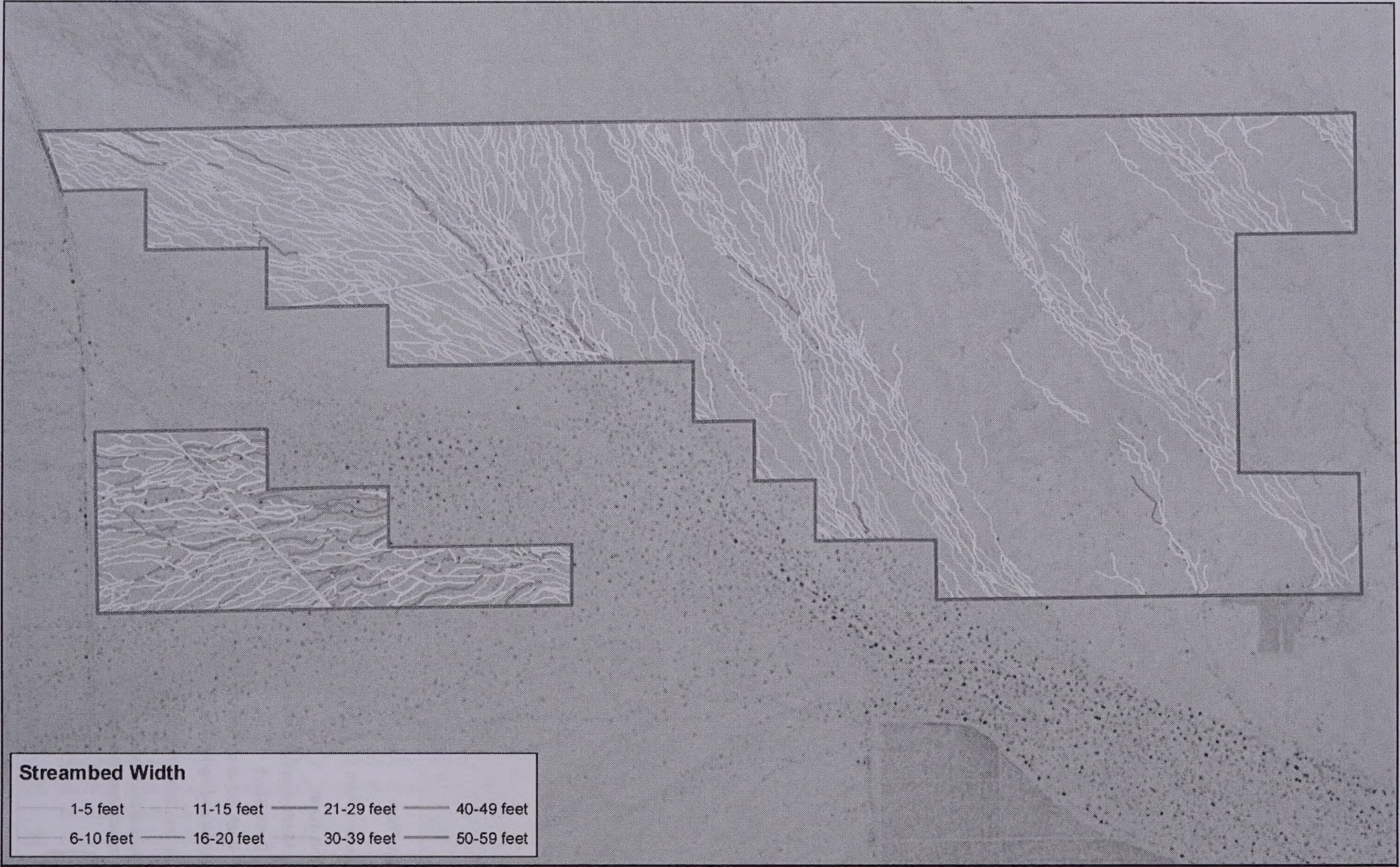


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Figure 7

CDFG Jurisdictional Streambeds

Appendix C.10

Integrated Weed Management Plan

Integrated Weed Management Plan
Desert Harvest Solar Project

Prepared for:

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July, 2012

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Appendix D. Example California BLM Pesticide Use Proposal.
Appendix E. Example California BLM Pesticide Application Records Form.

ABBREVIATIONS AND ACRONYMS

Best Management Practices	BMPs
Bureau of Land Management	BLM
California Department of Food and Agriculture	CDFA
California Department of Fish and Game	CDFG
California Environmental Quality Act	CEQA
California Invasive Plant Council	Cal IPC
Desert Harvest Solar Project	DHSP
Draft Environmental Impact Statement	DEIS
Generation interconnection line	gen-tie line
Global positioning system	GPS
Integrated Weed Management Plan	IWMP
Joshua Tree National Park	JTNP
Material safety data sheets	MSDS
Miles per hour	mph
Mitigation Measure	MM
National Environmental Policy Act	NEPA
Pesticide Application Record	PAR
Pesticide Use Proposal	PUP
Programmatic Environmental Impact Statement	PEIS
Photovoltaic	PV
Right-of-way	ROW
Standard Operating Procedure	SOP
Surface Water Protection Plan	SWPP
United States Environmental Protection Agency	EPA
United States Fish and Wildlife Service	USFWS

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Figure 1; all figures are in Appendix A). The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a).

This Integrated Weed Management Plan (IWMP) describes the proposed DHSP Project activities and components that may facilitate weed infestations; summarizes baseline data regarding weeds in the project vicinity; assesses potential risks that weeds may pose to natural resources values on the project site and in the surrounding area that could result from project construction, operation, and decommissioning; and describes monitoring and control measures to be implemented to minimize those risks.

Throughout this IWMP, the word “weed” is used to include any non-native plant that may interfere with natural resource values on the DHSP site or on surrounding lands. The most important effect of weeds on natural resources is invasion into natural habitats. Invasive weeds can displace native species, supplant food plants or other wildlife habitat elements (e.g., cover), alter natural habitat structure and ecological function, alter natural wildfire patterns, or displace special-status plant occurrences and habitat (Zouhar et al. 2008; Lovich and Bainbridge 1999). Due to this damage to habitat and natural systems, these plants are considered “weeds” or “pest plants” when they invade natural landscapes (Bossard et al. 2000). The spread of invasive plants is an important threat to biological resources in the California desert. Human activities, including the proposed DHSP, can affect weed distribution and abundance in two ways: they can introduce new weed species to an area, and they can facilitate propagation and spread of weeds already present.

Weeds and pest plants addressed in this IWMP will not be limited to “noxious weeds” as designated by federal and state agencies. Instead, weeds are defined here to include any species of non-native plants identified on the weed lists of the California Department of Food and Agriculture (CDFA), the California Invasive Plant Council (Cal IPC), or of special concern identified by BLM. In addition, any non-native species found on the site that has not been evaluated for its potential to invade or alter surrounding natural lands will be considered a weed for purposes of IWMP implementation.

Numerous invasive weeds have already become widespread throughout the Colorado Desert and for some invasive species the prevention of further spread is impracticable. Examples of these species include Mediterranean split grass (*Schismus* spp.), Russian thistle (*Salsola tragus*), and Saharan mustard (*Brassica tournefortii*). Others (e.g., saltcedar, *Tamarix ramosissima*) are damaging to specific habitat types but pose little or no threat to widespread upland desert habitat.

Within the project study area, the overall prevalence of invasive species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split grass, red brome (*Bromus madritensis* ssp. *rubens*), redstem filaree (*Erodium cicutarium*), Saharan mustard, London rocket (*Sisymbrium irio*), and Russian thistle.

1.1 Integrated Weed Management Plan Objectives

Weed management objectives for DHSP include the following:

Prevention. This IWMP seeks to prevent weeds already present on the site from becoming larger or more persistent infestations, and to prevent new weeds from becoming established on the site.

Detection/identification. The monitoring measures described in this plan are designed to identify weed infestations for further control efforts.

Control. Control strategies will be based on the potential threat of any given infestation. Control strategy will be based on the threat posed by a given weed species, and the location, abundance and extent of the infestation. For each infestation, potential control strategies are:

- *Eradication*. This control objective is to eliminate all individuals of a particular species within a specified area. This will be the goal for weed species that are new to the area (i.e., unknown threat) or known species posing (1) significant environmental concern; and (2) not already widespread in surrounding landscapes.
- *Suppression*. This objective will be selected for weed species and populations already widespread throughout the region and common on disturbed soils. The objective will be to reduce infestation density and minimize seed production and the threat for off-site spread; but not necessarily to reduce the total area or boundary of the infestation. This strategy will apply to many widely distributed, high-density weeds where eradication is not feasible.
- *Containment*. This objective will be aimed at preventing infestation expansion and spread, and may be conducted with or without any attempt to reduce infestation density. Containment focuses on halting spread until suppression or eradication can be implemented, and is practical only to the extent that the spread of seeds or vegetative propagules can be prevented.

2.0 PROJECT DESCRIPTION

The proposed DHSP is a 150-megawatt solar photovoltaic (PV) renewable energy generating facility and associated generation interconnection (gen-tie) line. The DHSP solar generation facility would be located on BLM-administered land north of Desert Center in Riverside County, and the 12-mile gen-tie line would primarily be on BLM land, with approximately one mile total located on Metropolitan Water District land and Riverside County land. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and an extension of the applicable permits, approvals and authorizations for the DHSP. Detailed descriptions of the proposed DHSP and alternatives can be found in Chapter 2 of the project's Draft Environmental Impact Statement (DEIS). A detailed description of the habitats found at the site and along the proposed and alternative gen-tie routes can be found in Chapter 3.3 of the DEIS. Figure 2 identifies the project site, the proposed gen-tie (Alternative B) and alternative routes, and the vicinity of the project area. Figures 3 and 4 identify the distribution of vegetation at the project site and gen-tie routes, respectively.

3.0 KNOWN AND POTENTIAL WEED OCCURRENCES

Within the project study area, the overall prevalence of invasive plant species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split grass, red brome, redstem filaree, Saharan mustard, London rocket, and Russian thistle. Appendix B contains a summary of the invasive plant species found on site, and treatment schedule, control options, and impacts to native vegetation and wildlife for each species. These and other invasive species with potential of occurring on the site now or in the future are listed in Table 1.

Table 1 presents threat rankings for each species as assigned by the CDFA and by Cal IPC (as applicable). Species were selected for inclusion in the table based on occurrence on or around the DHSP site and gen-tie alignments, or from comparable upland bajada habitats of the broader Colorado Desert region in California.

Two CDFA Class C weeds (Russian thistle and Mediterranean split grass) occur on the site and throughout the local area. No CDFA Class A or Class B weeds have been documented on the site.

BLM Risk Assessment guidelines recommend ranking risks according to (1) likelihood that a weed will spread to the project site, and (2) consequences of its establishment on the site.

BLM's recommended assessment of the first factor (likelihood of spread to the site) range from "none" to "high," based on occurrence and abundance in the surrounding area. However, these guidelines do not account for potential weed introduction via vehicle traffic from outside a project the area, and therefore do not address the most likely vector for weed introduction onto the DHSP site. For most weed species below, the likelihood of spread to the project site from adjacent areas is low or none (the only exceptions are those species already occurring on the DHSP site). However, any of these species, as well as species of unknown threat, could be spread to the project area by vehicle traffic during project construction, operation, or decommissioning. The most likely vector would be via seed or rhizomes that may be caught in the undercarriages of construction equipment.

Similarly, the BLM guidelines addressing consequences of establishment primarily refer to on-site consequences. These guidelines appear to address local habitat or range improvement projects, rather than land use conversions to renewable energy facilities. Whereas many weed infestations could degrade a range project, most weed infestations would have only minimal consequences for the solar facility. For the DHSP project, the most important consequences of any potential weed infestation is the likelihood that infestations may spread off the site and into surrounding natural landscapes, possibly including designated critical habitat for desert tortoise, or into Joshua Tree National Park (JTNP).

Due to the general inapplicability of the BLM guidelines to renewable energy land use conversion, the descriptions of likelihood of occurrence at the DHSP and consequences of occurrence/spread in Table 1 are based upon field experience on the site and throughout the Colorado Desert in California, rather than the BLM's recommended risk assessment methodology.

Human activities such as transportation and trade provide a constant source of new exotic species into California, including the Colorado Desert region, and serve to disperse exotic species already established into new areas. We cannot predict what new weed species might become problematic on the DHSP site or the surrounding area in coming decades. Therefore, the monitoring section of this IWMP includes measures to identify and control (generally by eradication) any non-native species new to the area that may be discovered on the site.

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Alhagi pseudalhagi Camel thorn	Widespread in California, many habitats, generally controlled by eradication efforts but new infestation sources are abundant in surrounding states	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Currently low, but may be introduced via vehicles or other vectors from surrounding areas; potential to colonize and infest in periodically mesic places (e.g., evaporation pond margins, leaking tanks)	Unknown likelihood of spread in arid bajada soils; high potential resource damage.
Avena spp. Wild oat	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Brassica tournefortii Saharan mustard	Widespread and abundant in Calif. deserts; common in interior valleys (e.g., W Riverside Co.); especially invasive in open sands and in disturbed soils (including natural disturbance)	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/A/B	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in local naturally disturbed soils such as washes and windblown sand.
Brassica spp., Other non-native mustards	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Bromus madritensis ssp. *rubens* Red brome	Ubiquitous and often abundant or dominant throughout region and throughout most of Calif.	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/B/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Bromus spp. Other non-native brome grasses	Widespread and abundant in W Calif. or at higher elev. or latitude in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
Centaurea melitensis, C. solstitalis Annual star-thistles	Widespread and abundant in W Calif.; new introductions are probably chronic in region; spread may be limited in low desert by soils and climate	CDFA: varies by species Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in low density infestations)	Probably minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Cynodon dactylon Bermuda grass	Widespread and abundant in much of Calif.; new introductions are probably chronic in region; in deserts, requires mesic soil conditions	CDFA: C Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Erodium cicutarium Redstem filaree; crane's bill	Ubiquitous and often abundant or dominant throughout region and throughout most of S Calif.	CDFA: n/a Cal IPC: Limited Impacts/ Invasiveness/ Distribution: C/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Halogeton glomeratus Halogeton	Widspread in arid regions of Calif and other western states; apparently spreading; to date, generally not invasive on well-drained bajada soils	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/A/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Hirschfeldia geniculata Summer mustard; short-pod mustard	Widespread and often abundant throughout much of Calif., including deserts;	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (not reported on site, but expected in surrounding area and likely to be introduced to the site)	Minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Hordeum spp. Hare barley, Mediterranean barley	Widespread and often abundant throughout much of Calif.; less invasive in well-drained desert bajadas	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (periodic introductions are likely; potential for localized establishment on roadsides or periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
Pennisetum setaceum Fountain grass	Widely planted as an ornamental, and spreading throughout S. Calif . in surrounding habitats	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region surrounding areas of persistent sources, e.g., Coachella Valley
Salsola spp. Russian thistle, tumbleweed	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited-Moderate Impacts/ Invasiveness/ Distribution: varies by species	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Schismus spp. Mediterranean grass, split grass	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited Impacts/ Invasiveness/ Distribution: B/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
Sisymbrium irio London rocket	Widespread and often common throughout much of Calif.; less common in deserts, mainly in seasonally slightly mesic or shaded sites	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	Occurs on the site and throughout the region; shaded areas and increased moisture (through dust control, etc.) likely to cause increased densities	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
Stipa capensis (=*Achnatherum capensis*) Cape ricegrass, various other common names	Established in western Coachella Valley, apparently spreading rapidly in that area	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/D	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region)
Tamarix spp. Tamarisk, saltcedar	Widespread and strongly invasive in riparian habitats throughout California and southwestern desert regions	CDFA: B Cal IPC: Limited-High Impacts/ Invasiveness/ Distribution: varies by species	High (seed introductions likely to be constant; potential for establishment in periodically mesic places such as evaporation pond margins, leaking tanks	Moderate; already widespread in deserts, but any new persisting seed source can become source of further invasion into natural riparin habitats
Tribulus terrestris Puncture vine	Widespread, especially roadsides, disturbed sites, and agricultural lands	CDFA: C Cal IPC: n/a	High (periodic introductions are likely; ongoing potential for establishment on the site)	Moderate; apparently adapted to regional soils/climate, though may require additional water

California Department of Food and Agriculture ratings (CDFA 2011):

A: Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state;

B: Eradication, containment, control or other holding action at the discretion of the commissioner;

C: State endorsed holding action and eradication only when found in nursery; action to retard spread outside of nurseries at the discretion of the commissioner—reject only when found in a crop seed for planting or at the discretion of the commissioner

Cal-IPC ratings: (Cal-IPC 2006):

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although establishment is generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

4.0 DESIGNATED BIOLOGIST RESPONSIBILITIES

The Designated Biologist, to be designated by the project owner (per Mitigation Measure [MM] Veg-1) will be responsible for managing and implementing weed monitoring and control efforts, as follows:

- Scheduling all vehicle and weed monitoring for all project components;
- Verify that vehicle inspections are conducted properly and completely;
- Review planting materials, erosion control materials, and other materials to ensure weed-free certification;
- Ensuring that each person assigned to monitoring for weeds is qualified in plant identification;
- Managing weed monitoring data;
- Prioritizing and implementing control efforts;
- Communicating with the project owner and resource agencies regarding weed management needs and priorities; and
- Preparing and submitting reports.

5.0 PREVENTION

Prevention or minimization of weed introduction and establishment will be implemented as follows:

Project Design and Construction. The extent of soil disturbance will be limited to the fenced project area and the minimum necessary area at each gen-tie tower, pull site, or other work area (per MM VEG-4).

Worker Environmental Training. Weed management will be incorporated as a part of mandatory training for all contractors, subcontractors, inspection personnel, construction managers, construction personnel, groundskeepers, maintenance personnel, and all individuals bringing vehicles or equipment onto the site during construction, operations, and decommissioning phases of the project. Training will include an explanation of the importance of weed management for natural resource values; specific requirements for vehicle washing; and other applicable measures to prevent the introduction and spread of weeds. Training will be incorporated into the project's Worker Environmental Awareness Program, as required by Mitigation Measure MM VEG-3.

Project workers will be required to inspect their clothing, shoes, and personal equipment, before arriving on the site, and to remove and dispose of weed seed and plant parts. The material will be bagged for disposal in a landfill.

Vehicle Wash Station. Vehicle ingress and egress will be limited to specific sites. All vehicles and heavy equipment entering the project area for the first time will be washed to eliminate or minimize introduction of weed seeds. In addition, any vehicle that has been operated off of paved roads or parking areas off the site (e.g., to shuttle workers or deliver materials and supplies) will be washed before re-entering the site. Vehicles delivering materials or personnel to a designated parking or laydown area will not require washing; however, these designated parking and laydown areas will be subject to weed monitoring and control (Sections 6 and 7, below).

An on-site wash station will be provided for most vehicle washing, near the entrance to the project site at Kaiser Road. Off-site washing may be acceptable only under the following conditions:

- The driver certifies that the vehicle has been fully washed, including the undercarriage, tires, insides of fenders, and other areas where mud or debris may collect, and that the interior has been swept or vacuumed;
- The driver provides a receipt or other verification of off-site washing;
- The vehicle is inspected on-site by a Biological Monitor (MM VEG-1) to confirm no accumulated mud or debris, or other material.

All vehicles arriving from off-site locations will be required to stop for inspection. Vehicles that have not been washed off-site will be washed before entering the site. Vehicles that were washed off-site but which appear to the inspector to have accumulations of mud or debris on the vehicle or equipment that could harbor weed seeds will be required to be washed again before entering the site. Heavy equipment entering the site on trailers must also be washed. The Biological Monitor will ensure that vehicles and equipment are free of soil and debris capable of transporting weed seeds, roots, or rhizomes before the vehicles and equipment are allowed to use access roads.

The wash station will be constructed with either a concrete wash pad or a completely cleared and compacted soil or gravel pad. Silt fencing, weed-free certified hay bales, or other means of trapping wash water, sediment, seeds, and other debris will be installed around the perimeter of the wash station. The wash station's location and proposed containment methods will be reviewed and approved by BLM prior to putting it into use.

Vehicles will be washed with high-pressure water equipment, concentrating on tracks, tires, and the undercarriage, including axles, frame, cross members, motor mounts, and on undersides of fenders, steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept or vacuumed and refuse will be disposed of in covered waste receptacles. Sediment accumulated from the washing area will be shoveled out regularly and placed in sealed containers for disposal in a landfill. If removal requirements exceed the capability of the wash station, equipment will be washed elsewhere before being allowed on the site.

A current written log of on-site vehicle washing and verification/inspection of off-site vehicle washing will be kept on the project site throughout the construction, operations, and decommissioning project phases. Electronic copies of the wash logs will be submitted with the annual reports (Section 8).

Weed-Free Materials. Any plant materials (such as hay bales, wattles, or other erosion control materials) brought onto the site shall be certified weed free. Any seed used in revegetation efforts or for erosion control will be certified weed free, and will consist only of plant species native to the Chuckwalla Valley. Additional products such as gravel, sand bags, silt fences, and mulch may also carry weeds. Such products will be obtained from suppliers who can provide weed free certified materials. Where feasible, mulch used for erosion control will be generated from native vegetation cleared from the site itself. The Designated Biologist will be responsible for checking deliveries and confirming certification of all materials.

Revegetation. enXco will reestablish soil stability and vegetation on temporarily disturbed sites by preparing and implementing a Vegetation Resources Management Plan (described in MM VEG-5). Reclamation, revegetation, or restoration shall occur on all temporarily disturbed areas, including, but not limited to, temporary access roads, construction work temporary lay-down areas, and staging areas.

6.0 MONITORING

6.1 Weed Identification, Mapping, and Data Management

Effective monitoring for weed infestations necessitates accurate identifications of weeds, and accurate distinction among native and non-native species, during early growth (i.e., before the plants set seed, to allow for early control or eradication). All weed monitoring will be conducted by a biologist familiar with the regional flora and familiar with seedling and early vegetative growth forms of regional weeds (Table 1) and common native species. All monitoring reports will include comprehensive species lists of all native and non-native species observed in the survey area. Any species not recognized in the field will be collected and identified using regional identification manuals (e.g., Baldwin et al 2002). Botanists will make pressed specimens of seedling, early-flowering, and mature samples of native and non-native species for further reference. Any species not readily identifiable using regional identification manuals will be preserved as a labeled specimen and forwarded to a recognized herbarium for identification by experts.

For certain weed species already known from the project site, or that are ubiquitous in the region, infestations will be recorded where the density and extent is greater (based on visual estimation) than baseline abundance in the surrounding natural landscape. This will apply only to the following 5 species (see Table 1):

- Saharan mustard
- Red brome
- Redstem filaree
- Russian thistle (tumbleweed)
- Mediterranean grass (split grass)

Baseline abundance will vary from year to year, depending on rainfall. Surveys to date have not identified any infestations at the project site that exceed the density and extent of those on surrounding lands; however, because of the potential for baseline abundance to vary, the Designated Biologist and qualified monitors will develop brief guidelines to estimate baseline abundance for each seasonal monitoring period. For all other non-native species, every occurrence documented during monitoring efforts will be recorded and targeted for follow-up control.

The locations of all weed infestations noted during monitoring efforts will be documented using hand-held global positioning system (GPS) units, and short descriptions of the location, extent, abundance, and phenology of each weed species (if known) will be recorded. Locations of any species (other than the 5 above), including any species not previously known from the site will also be flagged in the field to enable precise control efforts or other follow-up measures (see Section 7). All monitoring data will be retained and managed by the Designated Biologist in a spreadsheet or other data management software, along with follow-up data regarding control efforts, and follow-up monitoring.

6.2 Scheduling and Field Methods

Monitoring for weeds will be conducted throughout the entire project area, including the solar generator site (including all ancillary facilities, parking areas, administrative sites, and other related facilities); the off-site administration building and adjacent project-related facilities; all linear project components (gen-tie line; underground infrastructure connection between southern and northern PV generation fields); and throughout a 100-foot buffer area in any undisturbed lands adjacent to any project area.

Monitoring will be conducted twice annually throughout the construction, operations, and decommissioning phases of the project, and for a minimum 3-year period following decommissioning, or until any high-priority target weed species have been effectively controlled or eradicated. Complete weed-monitoring surveys will be conducted once in early spring (February or March) to detect winter-germinating species before they set seed; and once in late summer or early fall, to detect summer-germinating species. Depending on timing and amount of annual rainfall on the site (per the data collected at the on-site meteorological station) survey schedules may be adjusted or suspended, based on recommendation of the Designated Biologist and written agreement of BLM, California Department of Fish and Game (CDFG), and US Fish and Wildlife Service (USFWS).

Full-coverage weed monitoring of the project area will be conducted by walking over all access routes, parking areas, lay-down areas, or other disturbed areas (including internal roads throughout the site, the gen-tie line access route, the Kaiser Road right-of-way (ROW) on the underground infrastructure connection between the two solar generator areas, and the off-site administrative building) and throughout a 100-foot buffer in natural lands surrounding the sites. Special emphasis will be given to areas vulnerable to colonization including: roadsides, soil stockpiles, wash stations; previously disturbed areas, areas of prior weed infestation, areas near known weed infestations, and all areas with disturbed soils.

Along the project's linear features, and in the buffer areas surrounding project areas, monitors will also record locations of special status plant occurrences or any other biological resources where herbicide application would be inappropriate.

In addition, the Designated Biologist or other qualified Biological Monitor (per MM VEG-1) will periodically monitor all water sources or other wet areas on the site to check for water leaks and to determine if any weeds have become established. These areas will include, but will not be limited to:

- Water tanks;
- Storage and evaporation ponds;
- Roadsides where dust control water may collect;
- Water pipelines on the ground surface;
- Wells and associated facilities;
- Bathrooms, eating areas, wash stations, or any other sites where workers may use water.

Monitoring of these sites will be conducted monthly at minimum, and records of each monitoring date and results will be maintained in the project data files.

7.0 WEED CONTROL

7.1 Control Strategies and Prioritization

Weeds will be controlled according to abundance and extent of infestations and potential threat to offsite habitat. The control strategy for weeds that are ubiquitous in the region (e.g., red brome, redstem filaree, and Saharan mustard) will be suppression, with the objective of maintaining densities and extent at or below baseline levels. Strategies for weeds that are actively spreading in the region (e.g., Cape ricegrass), species that are strongly invasive in riparian habitats (e.g., saltcedar), or species altogether new to the region will be immediate eradication if possible, and containment until eradication is complete.

Infestation sites flagged during monitoring (Section 6, above) will be targeted for control as early as feasible, to prevent weeds from going to seed, reestablishing their seed bank, and spreading farther. Until control is implemented, the infestations will be surrounded by temporary orange vinyl construction fencing to prevent vehicles or pedestrians from entering the area and risking further spread of the targeted weeds. The Designated Biologist will be responsible for ensuring that temporary fencing is in place.

Specific control measures will be planned and implemented for each infestation. The Designated Biologist will review and approve each control measure prior to its implementation.

Weed infestations on linear project features; in high-traffic areas such as project staging areas, operating areas; and along access routes shall be high priority for control. Weeds that are common within the site and surrounding area will generally be given low priority where they occur in relatively low densities or in the interior of the area, distant from surrounding native vegetation. However, these infestations will be given higher priority if abundance is high enough to create a significant new propagule source that may increase weed infestation densities on adjacent lands.

7.2 Mechanical Control

Where weed infestations are small, or where they are adjacent to native vegetation or other sensitive biological resources (e.g., the site perimeter or in buffer areas), mechanical control methods will be implemented. Mechanical control may be appropriate for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Mechanical control methods include hand pulling of weeds and the use of hand or power tools to uproot, girdle, or cut plants. Lever arm tools such as Weed Wrench™ and Root Jack™ may be used to pull out woody shrubs such as tamarisk. Hand removal by pulling is appropriate when the plants are large enough that they will not break and leave the roots in the soil, where they would be likely to resprout. For control of small numbers of rooted woody species, this is the most effective method.

Hand pulling is less effective for weed species that spread via rhizomes or roots (e.g., Bermuda grass). Hoeing or other methods may be effective for these infestations, by carefully avoiding any adjacent native plants. Hoeing or other mechanical disturbance should not be used if weeds have set seed, to avoid further seed dispersal. Hoeing works best on patches of small weeds and on weeds that have a single root mass. It is less effective on larger weeds that can regenerate from cut roots.

Power weed-whips can be used for removal of tall annual species (such as Saharan mustard) but they should not be used on weeds approaching maturity, unless all cut material is carefully collected and removed from the site. Even seeds that have not matured at the time of cutting can finish maturing on the cut material, and then propagate the infestation.

Any plant material removed by mechanical control methods will be bagged and removed from the site, and transported to a landfill in a covered vehicle. No mulch or green waste from weed material will be stored or disposed of on the site.

7.3 Overview of Chemical Control

Where infestations are too large for effective mechanical control, and are not adjacent to native vegetation or other sensitive biological resources, herbicides generally will be used for control. Herbicides may be used for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Only certain herbicides are approved for use by the US Environmental Protection Agency (EPA), and only a subset of these are approved for use on BLM public land in California (Appendix C). This section describes the permitting and regulatory requirements relevant for chemical control of invasive weeds, the types of herbicides available, general application and handling procedures, specific herbicide application methods for pre- and post-emergent control.

PERMITTING AND REGULATORY REQUIREMENTS. Contractors applying herbicides must possess required permits from the state and Riverside County Agricultural Commissioner (as applicable). Permits may contain additional terms and conditions in addition to those described in this plan. Only a State of California and federally certified contractor will be permitted to perform herbicide applications. All herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. Only herbicides and adjuvants approved by the State of California and federal agency for use on public lands will be used within or adjacent to the project site. A list of approved herbicides and adjuvants is provided in Appendix C.

Guidelines for the use of approved herbicides are presented in the Chemical Pest Control Manual (BLM, n.d.). These guidelines require submittal of a pesticide use proposal (PUP) and pesticide application records (PAR) for the use of herbicides on BLM lands. A sample form required for the submittal of a PUP is included in Appendix D and a sample PAR form is included in Appendix E.

TYPES OF HERBICIDES. Herbicides can be characterized as pre-emergent, post-emergent, selective, and non-selective. A pre-emergent herbicide is one that generally controls un-germinated seeds by inhibiting germination. Post-emergent herbicides are generally lethal to plants after germination, but not to seeds. A few herbicides have both pre- and post-emergent activity. Herbicides can be selective or nonselective. If an herbicide is selective, it will affect some species of plants and not others, e.g., monocots (grasses) vs. dicots (broadleaf plants). A non-selective herbicide is one that is lethal to any plant species to which it is applied.

Herbicides kill plants through contact or systemic action. Contact herbicides are most effective against annual weeds and kill only the plant parts to which the chemical is applied. Systemic herbicides are absorbed either by roots or foliar parts of a plant and are then translocated within the plant. Although systemic herbicides can be effective against annual and perennial weeds, they are particularly effective against established perennial weeds. Pre-emergent herbicides inhibit germination of annuals from seed, but generally do not control perennial plants that germinate from bulbs, corms, rhizomes, stolons, or other vegetative structures. Common herbicide classes include the following:

Dinitroaniline Type: Examples of this class are pendimethalin (Weedgrass™), trifluralin (Treflan™), benefin (Balan™), and combinations of these. These herbicides provide for pre-emergence control of annual grasses and other annuals. Some of these herbicides should not be applied in temperatures above 90 degrees Fahrenheit (°F). All of these herbicides need to be watered into the soil for proper activation. Some persist for several months.

Dithiopyr (Dimension™): A selective herbicide primarily used for pre-emergence annual grass control in established turfgrass. However, it can be used for post emergence control of young grass seedlings. Dithiopyr breaks down in soil due to chemical and microbial degradation.

Glyphosates: The most commonly used post-emergent, non-selective herbicides are in a group called glyphosates. Glyphosate (e.g., Rodeo™, Roundup™, and Accord™) is a nonselective, systemic herbicide that is effective on many annual and perennial plants. Glyphosate is most effective if the entire plant is covered. Glyphosate should not be applied when the temperature exceeds 90°F. Glyphosate has a relatively low degree of oral and dermal acute toxicity (EPA 1993). It is considered to be immobile in soil and readily degrades by soil microbes. Glyphosate is minimally toxic to birds, fish, aquatic invertebrates, and honeybees (EPA 1993).

APPLICATION AND HANDLING. It is the responsibility of the herbicide user to observe all directions, restrictions, and precautions on herbicide labels. Store all herbicides in original containers with labels intact and behind locked doors. Keep herbicides out of the reach of children. The following general precautions will be implemented for herbicide application:

- Use herbicides at correct label application rates and intervals to avoid illegal residues or injury to plants and animals.
- Use herbicides carefully to avoid drift or contamination of non-target areas.
- Surplus herbicides and containers should be disposed of in accordance with label instructions to prevent contamination of water and other hazards.
- Follow directions on the herbicide label regarding restrictions as required by state or federal laws and regulations.
- Avoid any action that may threaten a rare, threatened, or endangered species or its habitat.

LIMITATIONS. Herbicide applications must follow EPA label instructions. Application of herbicides will be suspended when any of the following conditions exists:

- Wind velocity exceeds 6 miles per hour (mph) during application of liquids or 15 mph during application of granular herbicides.
- Snow or ice covers the foliage of weeds.
- Precipitation is occurring or is imminent.
- Air temperatures exceed 90°F.

TRANSPORT AND MIXING. Herbicides will be transported within the project site with the following provisions:

- Only the quantity needed for that day's work will be transported at any given time.

- Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment.
- Mixing will occur over a drip-catching device, and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies.
- Herbicide equipment and containers will be inspected for leaks daily. Disposal of spent containers will be in accordance with the herbicide label.
- During the operations phase of the project, herbicides will be stored only in cabinets of approved design and will be under lock and key.

SPRAY METHODS. Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used only in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered weed populations or in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically throughout treatment to ensure proper application rates.

HERBICIDE SPILLS AND CLEANUP. Reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, immediate cleanup will be implemented. Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. The following items are to be included in the spill kit:

- protective clothing and gloves
- absorptive clay, "kitty litter," or other commercial adsorbent
- plastic bags and bucket
- shovel
- fiber brush and screw-in handle
- dust pan
- caution tape
- highway flares (use on established roads only)
- detergent

Response to herbicide spills will vary with the size and location of the spill, but general procedures include the following:

- traffic control
- dressing the cleanup team in protective clothing
- stopping the leaks
- containing the spilled material
- cleaning up and removing the spilled herbicide or contaminated adsorptive material and soil
- transporting the spilled herbicide and contaminated material to an authorized disposal site

HERBICIDE APPLICATION METHODS BY PLANT TYPE. Controlling post-emergent herbaceous species:

- Apply a foliar application of Round-up™ or Rodeo™ on each plant at a minimum rate of 2.5 percent (plus 2 percent by volume [V/V] of nonionic surfactant). Apply Roundup™ in upland areas. Apply Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Provide applications on a spray-to-wet basis with coverage uniform and complete.
- Avoid contact with established native shrub and grass species.
- Temporarily discontinue work in the event of gusty winds or winds in excess of 6 mph.
- Temporarily discontinue in the event of rainfall.
- Ensure applicators possess current pest control licenses valid in the State of California and wear gloves, masks, and long sleeves as protection from chemical injuries.
- Leave sprayed vegetation undisturbed for 7 days until visible effects of herbicide application are present such as wilted and brown foliage.
- If any seed reached maturity, remove all treated plant materials by placing all noxious weed material potentially containing propagules in durable bags. Bags shall be sealed prior to transport. Noxious weed material shall be disposed of by covered transport to an appropriate landfill.

Controlling post-emergent woody species:

- Cut sprouts or woody stems to a height of 12 inches or less above ground and remove all aboveground debris for disposal at a suitable landfill.
- Apply Round-Up™ or Rodeo™ at a 100 percent rate to the cut sprouts or stems within 2 minutes of cutting. Use Round-up™ in upland areas. Use Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Cover all loads with a tarpaulin to transport vegetation trimmings.
- Apply follow-up foliar applications as described in the previous section to stem regrowth that occurs after initial control effort.
- Continue monitoring cut stems for as long as necessary to ensure complete mortality.

Controlling seed banks with pre-emergent herbicides:

Pre-emergent herbicides may be used in areas that have repeated infestations of annual weeds, with evidence of a persisting seed bank. These areas will be sprayed with pre-emergent herbicides during appropriate pre-germination periods. Application will follow the spray application guidelines described above for post-emergent herbaceous species.

7.4 Proposed Herbicide Application

The primary use of herbicides at the DHSP will be for control of invasive annual herbaceous upland weeds expected to propagate on disturbed soils throughout all project facilities. The most common annual upland weeds are likely to be Saharan mustard, red brome, redstem filaree, and Mediterranean grass. Herbicide treatment will be utilized within the solar generator site and related facilities, on disturbed soils at the gen-tie structures and other work sites (only as compatible with revegetation efforts). Herbicides will not be utilized within or adjacent to any undisturbed native vegetation, e.g., buffer areas beyond the perimeter of the DHSP site or disturbed work areas, or margins of work sites on the gen-tie line. Herbicide treatments conducted on the gen-tie line or at any other location outside the project's desert tortoise exclusion fence would use only the herbicide Glyphosate, which has been shown to have low toxicity to test animals.

The method of herbicide treatment for the control of upland weeds would not be expanded beyond those herbicides analyzed in the BLM's 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS). Under this alternative, ground applications of herbicides approved for use in California such as Glyphosate-, Imzazpyr- or Clopyralid-based herbicides would be used at application rates consistent with the label and the 2007 PEIS. Application methods consistent with the label would be used to treat upland weeds. These methods would consist of using a hand held compression sprayer or backpack sprayer. All treatments would be supervised or overseen by a certified pesticide applicator who is knowledgeable in plant identification and familiar with proper herbicide application techniques.

Access to the treatment sites would be by existing roads or new roads to be constructed as a part of the DHSP. No additional access routes would be constructed for weed management, and there would be no vehicle access off established roads. Herbicide, equipment, and personnel would be brought to treatment sites by a truck, van, or car.

All herbicide application would conform to requirements of DHSP DEIS MMs quoted below:

Mitigation Measure HZ-1.5 (Use licensed herbicide applicator) requires that:

> *"During the construction and operational phases of the project, the contractor or personnel applying herbicides shall have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. Herbicides shall be mixed and applied in conformance with the product manufacturer's directions. The herbicide applicator shall be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and material safety data sheets (MSDS) for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and waterbodies, herbicides shall not be applied directly to wildlife, products identified as non-toxic to birds and small mammals shall be used if nests or dens are observed, and herbicides shall not be applied within 50 feet of any surface waterbody when water is present. Herbicides shall not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water. Herbicides shall not be applied when wind velocity exceeds 10 miles per hour. If spray is observed to be drifting to a non-target location, spraying shall be discontinued until conditions causing the drift have abated.*
>
> *Prior to any herbicide application, the herbicide applicator shall contact the Environmental Monitor to show where work will be done and to receive information/ training about potentially sensitive biological resources that may be within the area to be sprayed and methods to apply to minimize those impacts. A Worker's Training Manual shall be prepared and include a provision on herbicide application. Once facility operation commences, this Manual shall be given to any herbicide applicator to be reviewed prior to spraying.*
>
> *Monitoring: Compliance will be verified by onsite environmental monitor during construction, and by Operations Plant Manager.*

Applicant Measure WR-1 (Manage Hazardous Materials and Use SPCC Plan) requires that the applicant or its agents will take numerous measures to manage hazardous materials:

- *Train construction staff in the management of hazardous materials and use of spill control and cleanup equipment;*
- *Have a clear chain of command within the organizational structure with responsibility for implementing, monitoring, and correcting Best Management Practices (BMPs);*
- *Cover and contain hazardous materials so that they are not in contact with precipitation or runoff;*
- *Store hazardous materials in one or more central areas, and institute rules requiring all hazardous materials to be secured at the end of the day;*
- *Maintain good inventory records; store hazardous liquids and dispensing equipment in secondary containment;*
- *Maintain adequate quantities of spill containment and response equipment at readily accessible points throughout the site;*
- *Identify the worst case and most likely spill scenarios, and provide spill response equipment adequate to respond to these scenarios;*
- *Use chemicals presenting the least environmental hazard wherever possible;*
- *Store the smallest quantities of hazardous materials possible on the site;*
- *Maintain site security to reduce vandalism;*
- *Require all contractors to abide by the program BMPs and to identify any hazardous materials and specific BMPs pertaining to their trade or activity.*
- *The SPCC Plan for the site would address storage of mineral oil contained in transformers. A SPCC Plan is required when 10,000 gallons or more of mineral oil in electrical equipment is contained on site, or when 1,320 gallons of petroleum is stored on the site, although an SPCC Plan can be voluntarily implemented for lesser quantities. The SPCC Plan would address methods and procedures for managing these products, lighting, security, containment requirements, training requirements, staff responsibilities for inspecting storage and dispensing equipment; and equipment and procedures for responding to a spill or release of stored petroleum products.*
- *Riprap increases surface roughness and slows runoff velocities, decreasing sediment transport, and increasing flow depth. Riprap would be used in conjunction with decompaction of soil, as riprap would not mitigate flow or volume.*
- *Check whether dams can be constructed to address specific post-development hydraulic characteristics, if needed.*

Mitigation Measure WAT-9 (Accidental Spill Control and Environmental Training) requires:

> *"Prior to the onset of construction of the project, the following specifications must be provided by the Applicant to the BLM: define areas where hazardous materials would be stored, where trash would be placed, where rolling equipment would be parked, fueled and serviced, and where construction materials such as reinforcing bars and structural steel members would be stored. The Applicant shall also prescribe hazardous materials handling procedures for reducing*

> *the potential for a spill during construction, and shall include an emergency response program to ensure quick and safe cleanup of accidental spills. These specifications may be included in the Surface Water Protection Plan (SWPP) described in MM WAT-4, or may be included as a separate plan. Compliance will be verified by the Environmental Monitor at the time of construction."*

Mitigation Measure MM VEG-8 includes numerous measures for streambed protection, including the requirement that that "Mixing of herbicides and adjuvants in the field would be conducted outside of jurisdictional wash habitat and in areas that would not allow drainage to a water body in the case of a spill. This is consistent with the SOP for water resources."

The mitigation measures quoted above are consistent with applicable Standard Operating Procedures (SOPs) and mitigation measures contained in the PEIS. If cases of any conflict between project mitigation measures and SOPs, the more restrictive of the two standards will apply.

There are no riparian, wetland, or aquatic habitats on the project site, and mitigation measures require that water overflow from tanks, pumps, or other sources must be monitored and controlled. Therefore, there will be little opportunity for weeds that are invasive in these habitats to become established on the site. In the even that salt cedar or similar species colonize around project facilities, the weed monitoring program (Section 6) will identify these plants before they become significant infestations, and control will generally be by mechanical means (pulling). In the unlikely event that salt cedar becomes well-enough established that mechanical pulling is ineffective, then cut-stump treatment using Imazapyr or Triclopyr may be implemented, and only away from any open water. This IWMP does not propose to use herbicides in or around open water at any time.

Table 2 provides an herbicide application matrix that outlines herbicides, application rate treatment method(s), and treatment timeframe for a variety of weeds that could occur on site.

Table 2. Herbicide Application Matrix

Weed Species	Treatment Timeframe	Treatment Method(s)	Active Ingredient / Application Rate
Salt cedar (tamarisk)	Year-around	Cut stump or foliar	Imazapyr (3 qt./ acre) or Triclopyr (2 gal./acre)
Saharan mustard	Early spring	Foliar	Glyphosate (4 qt./ acre)
Camelthorn	Spring or fall	Foliar	Imazapyr (3-4 pt./ acre)
Russian thistle	Early spring	Foliar	Imazapyr (2-3 pt./ acre) or Glyphosate (4 qt./ acre)
Common annuals, including red brome, redstem filaree, and Mediterranean grass	Spring	Foliar	Glyphosate (1 qt./ acre)

7.5 Potential Effects of Herbicide Use

Herbicides pose risks to terrestrial and aquatic vegetation. Most aquatic herbicides, and several terrestrial herbicides, are non-selective and could adversely impact non-target vegetation. Accidental spills and herbicide drift from treatment areas could be particularly damaging to non-target vegetation on BLM land, and crop plants or other vegetation found on privately-owned lands near treatment areas. Herbicides may also pose risks to terrestrial or aquatic animal species. Herbicides that persist on site could adversely affect animals that feed on target plants or are exposed to the herbicides (e.g., by digging or rolling in treated soil). Accidental spills and herbicide drift from treatment areas could reach non-target vegetation or habitat on public or private lands near treatment areas. Section 7.4 includes specific measures to avoid application at project perimeters, in the vicinity of native vegetation or special-status plants, and to avoid overspray or spillage in any areas. In addition, Section 7.4 describes proposed usage and formulations of herbicides at the DHSP. Use of herbicides would be in accordance with the measures and standard operating procedures in the BLM's Herbicide PEIS. As described in Chapter 1 of the DHSP DEIS, that document is tiered to the Herbicide PEIS. Complying with the measures and standard operating procedures in the Herbicide PEIS, MM PHS-9, as well as other limitations described above, would avoid potential adverse effects of herbicides to native vegetation and special-status plants. Risks to vegetation from proposed herbicides would be similar to, or less than, risks from currently-available herbicides. Buffer zones would be used to reduce the risks to vegetation from herbicide treatments.

8.0 REPORTING

Throughout the construction, operation, and decommissioning phases, and for a minimum of 3 years following completion of decommissioning, the Designated Biologist will be responsible for providing annual Weed Management Reports to the BLM, CDFG, USFWS, and JTNP for review and approval. In addition, the Designated Biologists will be responsible for providing a short memo to each agency after completing each of the two annual monitoring efforts (early spring and late summer/early fall). These memos will simply summarize the results of monitoring and briefly describe planned (or completed) control efforts, and highlight any new or unexpected findings, particularly any weeds new to the site or to the area.

Each annual report will include the following contents:

- The location, species, extent, and density of weeds on the site. Data will include maps, text, tabular data, and photographs of any significant findings (previously unrecorded weed species, or any dense weed infestations resistant to control and threatening to spread off-site);
- Management efforts, including date, location, type of treatment implemented, results, and ongoing evaluation of success of treatment; and
- Information on implementation and success of preventative measures, including status of equipment wash facilities, list of workers that have completed the worker environmental training program, and copies of vehicle wash logs.

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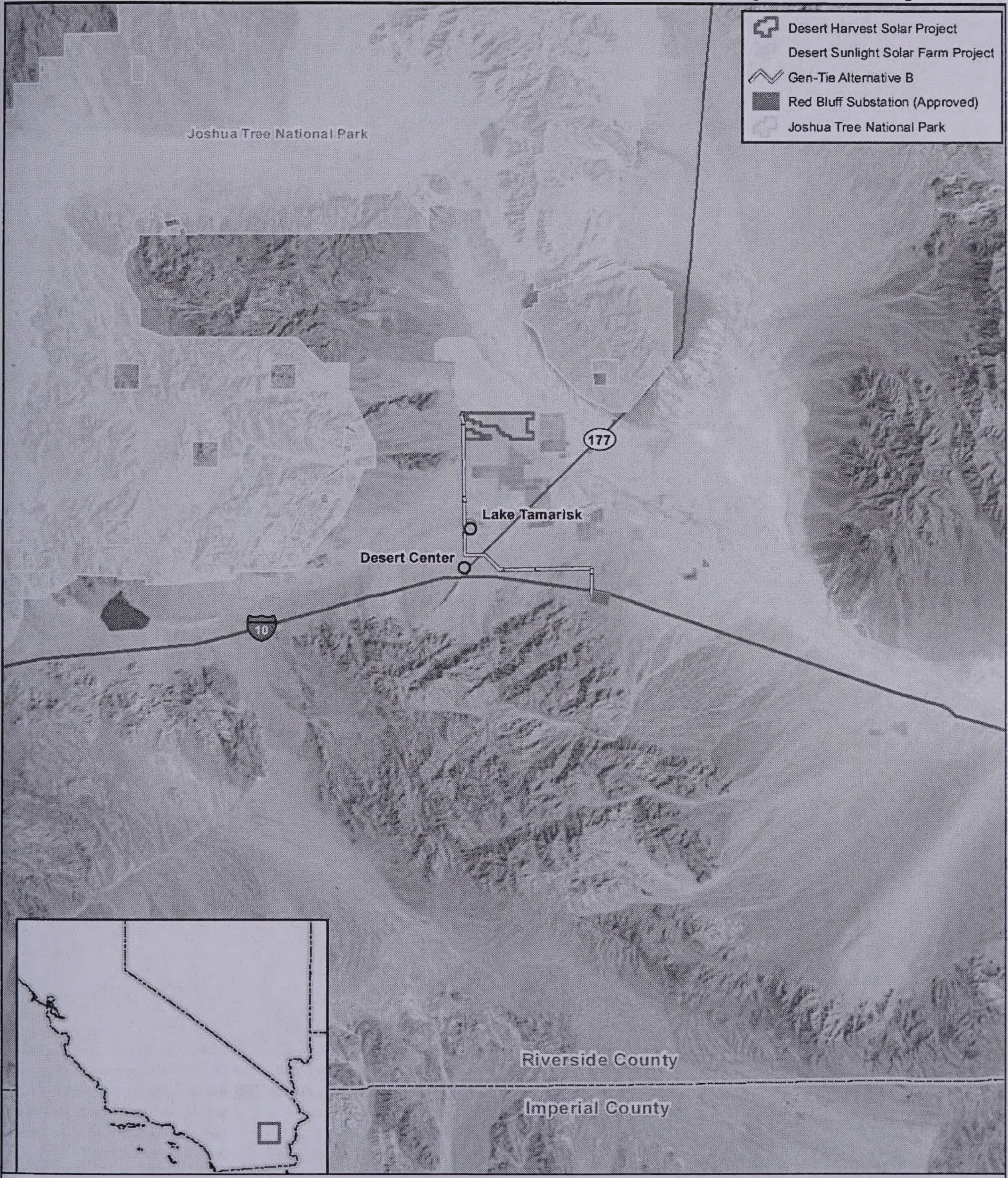
Appendix A

Figures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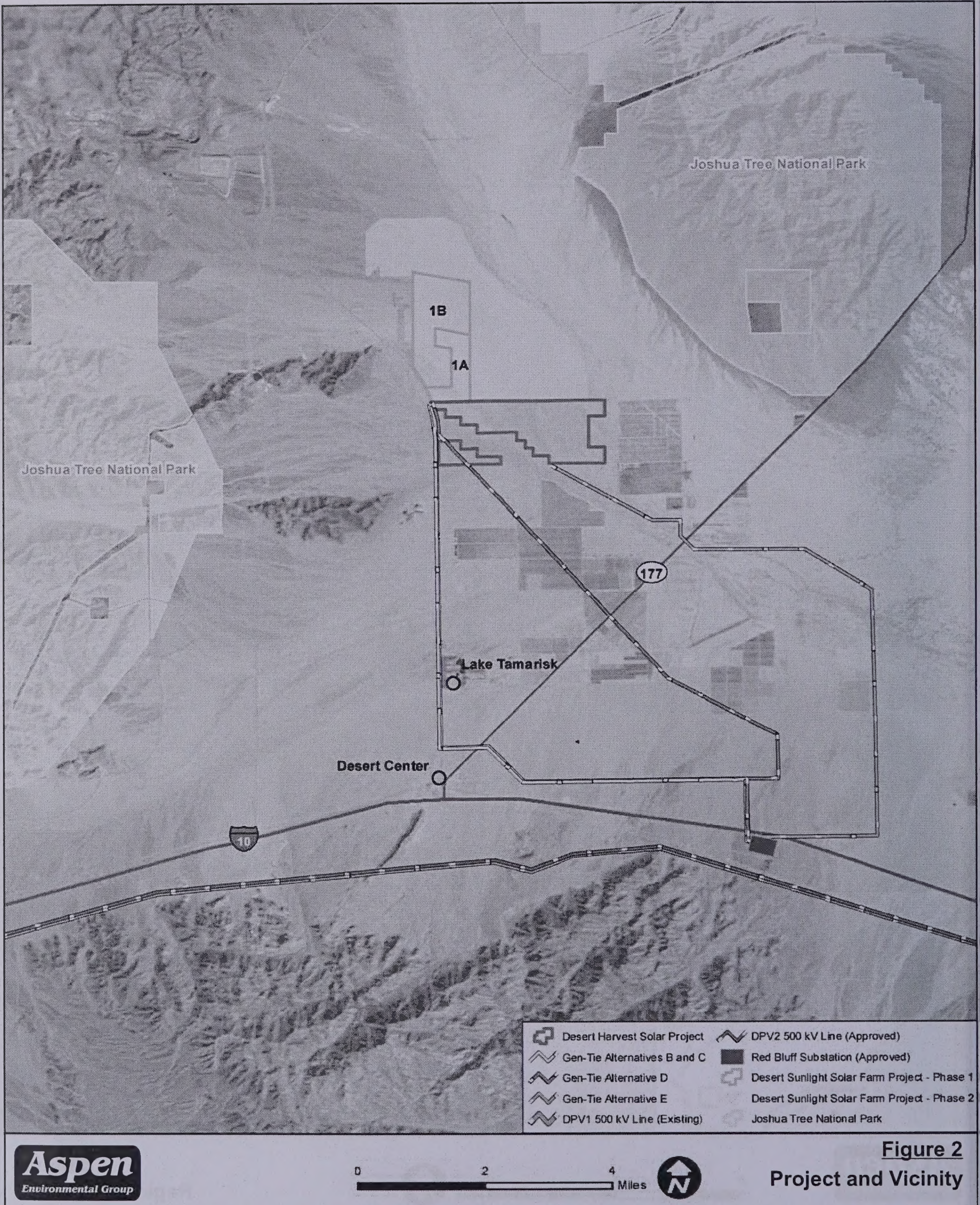
Desert Sunlight Solar Farm Project
Gen-Tie Alternative B
Red Bluff Substation (Approved)
Joshua Tree National Park
Joshua Tree National Park
177
Lake Tamarisk
Desert Center
10
Riverside County
Imperial County
0
5
10
Miles
N

Aspen Environmental Group

Figure 1

Regional Location


Joshua Tree National Park
Joshua Tree National Park
1B
1A
177
Lake Tamarisk
Desert Center
10
Desert Harvest Solar Project
Gen-Tie Alternatives B and C
Gen-Tie Alternative D
Gen-Tie Alternative E
DPV1 500 kV Line (Existing)
DPV2 500 kV Line (Approved)
Red Bluff Substation (Approved)
Desert Sunlight Solar Farm Project - Phase 1
Desert Sunlight Solar Farm Project - Phase 2
Joshua Tree National Park
0
2
4
Miles
N

Aspen Environmental Group

Figure 2
Project and Vicinity

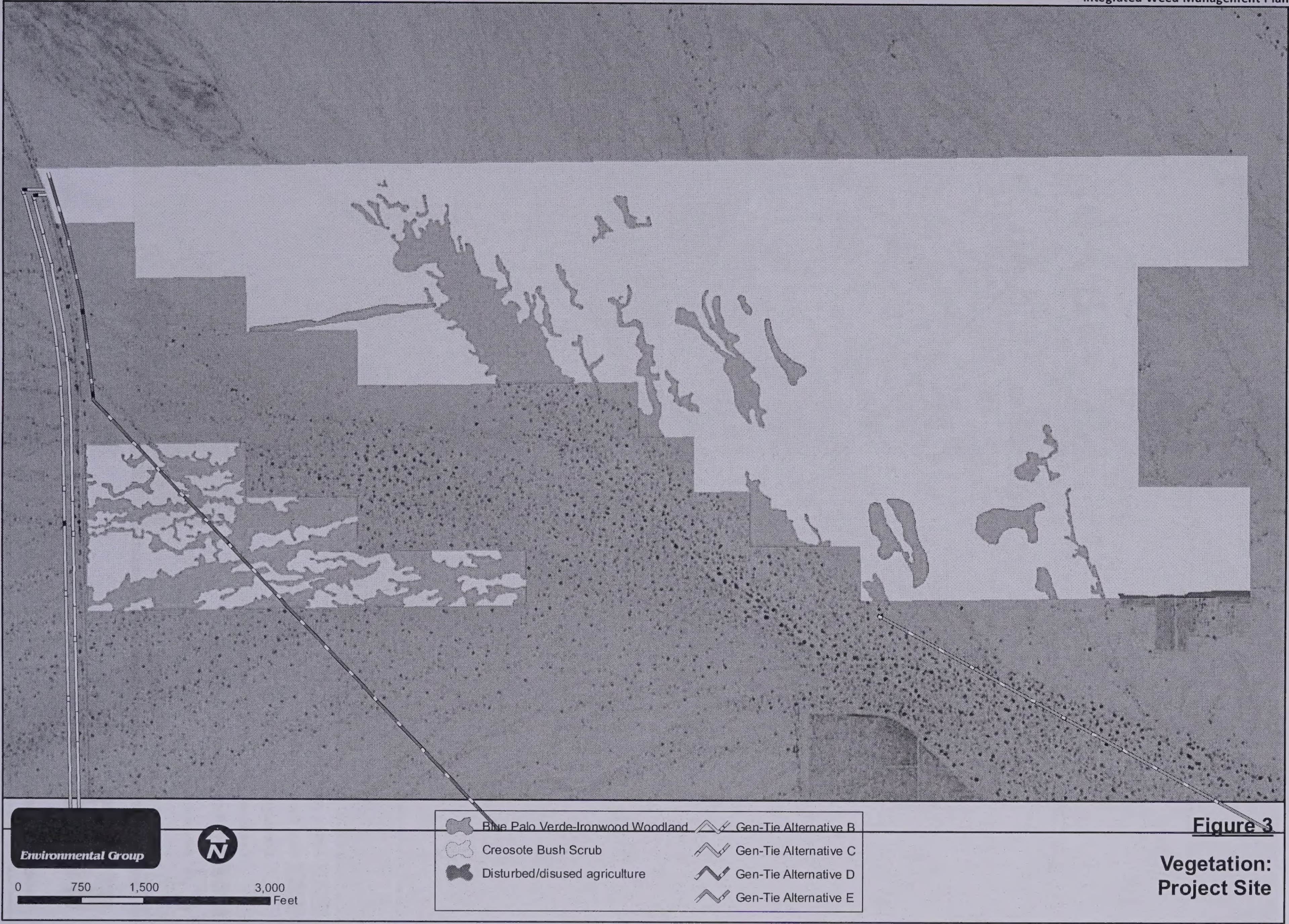


Figure 3

Vegetation: Project Site

April 2012

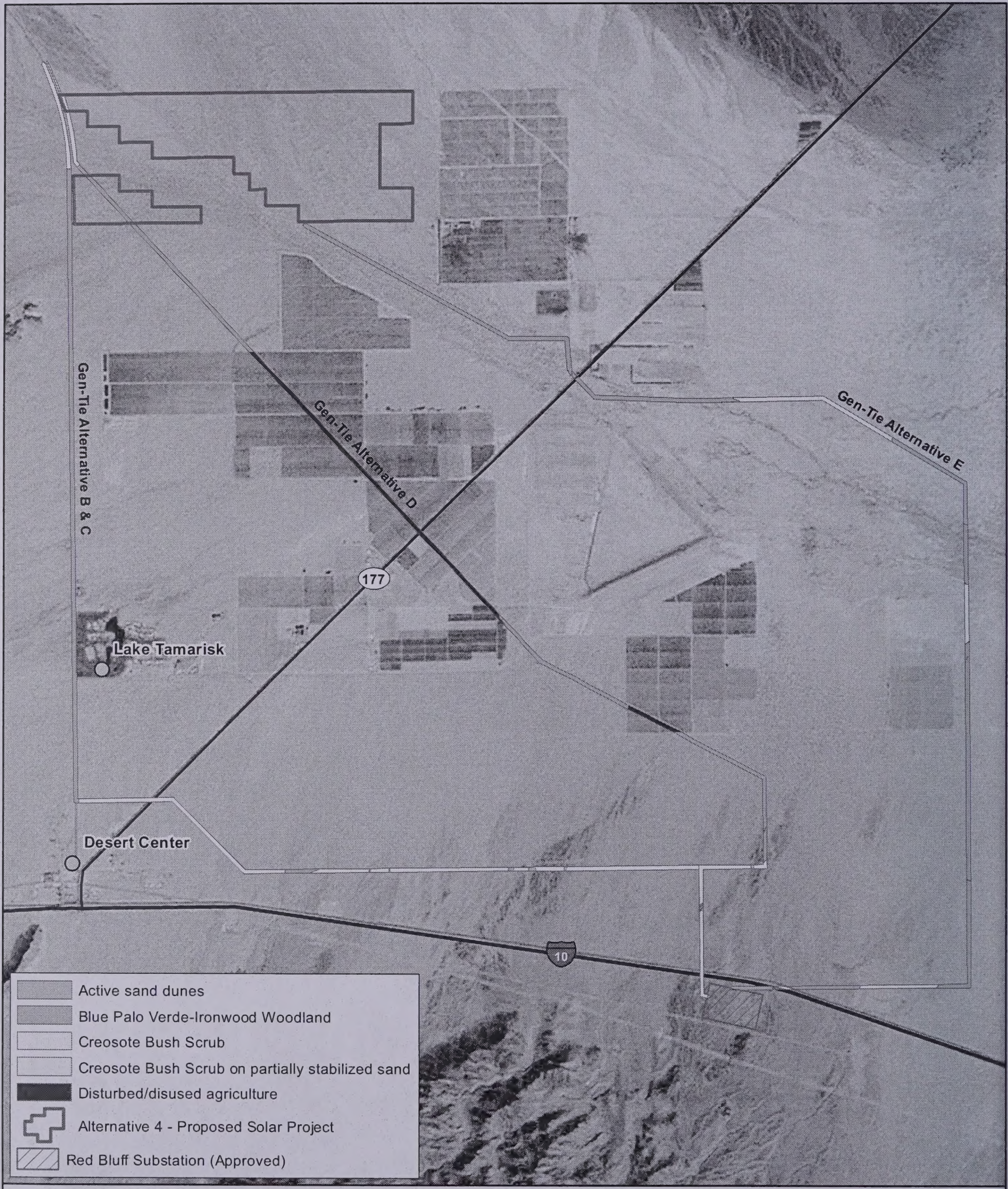

Gen-Tie Alternative B & C
Gen-Tie Alternative D
Gen-Tie Alternative E
177
Lake Tamarisk
Desert Center
10
Active sand dunes
Blue Palo Verde-Ironwood Woodland
Creosote Bush Scrub
Creosote Bush Scrub on partially stabilized sand
Disturbed/disused agriculture
Alternative 4 - Proposed Solar Project
Red Bluff Substation (Approved)
Aspen Environmental Group
N
0
0.5
1
Miles

Figure 4

Vegetation: Gen-Tie Line Alignments

April 2012

Appendix B

Approved Herbicides and Adjuvants

Appendix B
Summary of Invasive Plant Species within the DHSP Study Area and the potential effects of herbicide use on vegetation and wildlife.*

Saharan Mustard (*Brassica tournefortii*)
Cal-IPC Rating: High

Description	DHSP Weed Occurrence and Potential Weed Impacts	Treatment Schedule	Control Options			Potential Herbicide Impacts to Native Vegetation	Potential Herbicide Impacts to Wildlife
			Prevention	Physical Control	Chemical Control		
Saharan mustard is an annual herb native to Mediterranean climates of North Africa, the Middle East, and southern Europe that has invaded the low elevation deserts of the southwest United States—southern Nevada, southern California, Arizona, New Mexico, and west Texas. It typically occurs in sandy or gravelly soil, although it is also able to grow on alluvial fans and rocky hillsides. Unlike many invasive plants it does not require disturbed soil to become established. Saharan mustard is a robust, fast-growing annual with a basal rosette of leaves and densely branching stems with stinging hairs (University of Nevada Cooperative Extension [UNCE] 2002). The basal rosette can grow to 3 feet in diameter. The erect stem can be 4–40 inches tall and highly branched, and forms a "tumbleweed" when the plant dries and the stem breaks off. Seeds germinate following the first winter rains; the plants flower as early as December or January, and may set seed as early as February. The flowers are small and pale yellow. Each long fruit pod can contain up to 9,000 1 millimeter-wide seeds that have a very high germination rate.	Saharan mustard was documented throughout the study area at low densities. Minimal consequence to native vegetation for chronic low-density infestation; high-density infestation could cause further invasion in local naturally disturbed soils such as washes and windblown sand. Primary impacts to native vegetation would be competition for water and interference with native seed germination and establishment, should Saharan mustard densities become high. Saharan mustard forms dense stands that crowd out native annuals and shrub seedlings. It has a competitive edge due to its early phenology, which allows it to establish roots and collect soil moisture before later-germinating native species.. Low-density infestations likely have little impact on wildlife, but at higher densities Saharan mustard could compete with and reduce the productivity of native plants, thereby altering the availability of forage plants and the characteristics of their habitat structure. It also promotes the spread of fire.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Control of Saharan mustard along roadsides will help to prevent its spread to new areas. Avoid driving vehicles or walking through infested areas once this plant has gone to seed, especially following a rain event, as the mucilaginous coating on the seeds allow them to stick to objects and be transported. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Hand-hoeing seedlings or digging out small plants is an effective means of controlling this species in areas where the infestation is small and contained. It is especially effective if the invasion is new and a seed bank has not accumulated. Any physical removal should be conducted prior to the plant's producing seed. Any vegetative material should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Care should also be taken during transport of the materials to ensure they are secure (and do not, for example, fly out of the back of a truck). A site should be revisited in order to catch later-germinating plants, especially if there have been multiple rain events. Weed whipping is not recommended as the plants will simply continue to grow from the remaining portion of the plant (UNCE 2002). Plants growing in areas with lower mustard density often have more access to resources and subsequently produce a high number of seeds (Trader et al. 2006); therefore, even areas of apparently light infestation should be treated, when possible.	Glyphosate (4 qt./ acre maximum). Saharan mustard is often the first winter annual to germinate in an area, making effective herbicide treatment possible while minimizing impacts to non-target species. According to the National Park Service (NPS), Saharan mustard can be controlled with glyphosate (1.5 lb/acre) (Mau–Crimmins et al. 2005), which kills fewer native forbs than Triclopyr and Chlorsulfuron (Sahara Mustard Consortium). Application of post-emergent herbicides should be done prior to the development of seed pods, which may still ripen following herbicide treatment (UNCE 2002). Refer to specific product labels for proper application rates and restrictions.	Glyphosate is a non-selective systemic herbicide that can damage all plants to varying degrees. However, it has low residual activity, so it is not effective for an extended period of time. Exposure via direct spray poses a moderate to high risk to sensitive plant species and low to moderate risk to tolerant plant species; Low to moderate risk to sensitive species is predicted for ground broadcast and aerial applications at the maximum application rate, at off-site distances of 100 feet or less. Drift from ground broadcast applications at the typical application rate would pose a low risk to sensitive species within 25 feet. Drift also could affect lichens and bryophytes. If glyphosate was directly applied using a backpack sprayer, little if any damage due to drift would be anticipated. Plant species are not likely to be affected by runoff of glyphosate under any conditions. There is little indication that adverse effects to aquatic plants are plausible for typical applications of glyphosate (BLM 2007). Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.	Direct glyphosate spray of a small animal and an insect, both assuming 100% absorption, poses a low risk at the typical application rate and a moderate risk at the maximum application rate. Consumption of vegetation contaminated by a spill poses a low risk to small mammals for scenarios involving for the maximum application rate only. A large mammal consuming contaminated vegetation would face low acute risk for scenarios involving the typical application rate, moderate acute risk, for scenarios involving the maximum application rate, and low chronic risk for scenarios involving the maximum application rate; a large bird consuming contaminated vegetation would face a low acute and chronic risk. Consumption of contaminated insects would pose a low risk to small mammals and small birds if the herbicide was applied at the typical application rate or a moderate risk if applied at the maximum rate. Acute risks from glyphosate exposure are low at the typical application rate under all scenarios, and there are no chronic risks. Exposure scenarios with the greatest risk are direct spray and acute consumption of contaminated vegetation and insects. Spot applications would have lower risks than broadcast applications, as fewer non-target areas would be impacted. Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.

	Red Brome (*Bromus madritensis* ssp. *rubens*) **Cal IPC Rating: High**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Red brome is an annual grass native to southern Europe, northern Africa, and southwestern Asia; it is thought to have become established in California in the mid-1800s and have become naturalized by the late 1800's (Brooks 2000). Its distinctive brush-like inflorescences are reddish purple at maturity. Because it is a prolific seed producer and colonizer, It emerges in early winter following rainfall but remains inactive until spring when rainfall and warmer temperatures stimulate growth and flowering. Plants growing in dry conditions may be less robust and have a more open panicle. Red brome has become widespread in the Sonoran Desert (Van Devender 1997) and, although it is not typically a prolific invader in desert habitats, it can be abundant in slightly moist microhabitats such as beneath perennial shrubs, around rocky outcrops, and along margins of roads and washes (Brooks 2000).	Red brome can negatively impact habitat in several ways, including competition with native species for moisture, nutrients, and light; conversion of native plant communities to non-native grasslands; promotion of wildfires and alteration of fire regimes; and injury to native and domestic animals (Brooks 2000).Low-density infestations likely have little impact on wildlife. At high densities, red brome reduces ecosystem functioning by increasing the fire frequency, altering hydrology, lowering habitat value for wildlife, and displacing plants that are better forage for wildlife.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Control of this species along roadsides will help to prevent its spread to new areas. Avoid driving vehicles or walking through infested areas once this plant has gone to seed. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Because it is an annual plant, manual removal of plants through pulling or hoeing can be effective, if done before seeds mature. This is most feasible with small infestations as it is labor intensive. Any cut or pulled vegetative material containing inflorescences should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Care should also be taken during transport of the materials to ensure they are secure (and do not, for example, fly out of the back of a truck).	Glyphosate (1 qt./ acre). Herbicide should only be applied prior to seed set. Glyphosate is an effective herbicide for reducing populations of red brome. Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.
	Redstem Filaree (*Erodium cicutarium*) **Cal IPC Rating: Limited**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Redstem filaree is a non-native annual forb native to the Mediterranean region. It was likely introduced to California in the mid-1700's. It favors well-drained clay, loam, or sandy soils, and is a rapid colonizer of disturbed sites (Howard 1992). Redstem filareecan grow up to 20 inches tall but is highly variable in size. It has hairy leaves with finely dissected, often toothed, lobes.	Redstem filareeis is widely distributed, but apparently has limited impacts on most native vegetation. If it spreads or increases in density, its negative effects on native plant establishment and growth would likely increase. Redstem filaree provides seasonal forage for rodents, desert tortoise, big game animals, and livestock. The seeds are eaten	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Hand pull or remove using hoes or other hand tools.	Glyphosate (1 qt./ acre). Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.

The young leaves form a basal rosette, with older leaves growing up to 12 inches in height (Howard 1992). The plant has one main taproot, usually about 3 inches long. The pink, 5-petaled flowers contain persistent flower styles, which are attached to the fruit at the base, are up to 2 inches long and coil at maturity. When moistened, these styles uncoil and can push the sharp-pointed seed up to 1 inch into the soil. Seeds can remain viable for many years, resulting in a potentially large seed bank (Howard 1992). Redstem filaree germinates in late fall, slows growth during the colder winter months, then rapidly grows, flowers, and produces fruits once the weather warms (Howard 1992).	by upland game birds, songbirds, and rodents (Howard 1992). However, at high densities, it can compete with and reduce the productivity of native plants, thereby altering the availability of higher-quality forage plants and the characteristics of their habitat structure.						
	Russian Thistle (*Salsola* spp.) **Cal IPC Rating: Limited-Moderate**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Russian thistle, also commonly called "tumbleweed," is an invasive, bushy summer annual native to Eurasia and north Africa. It was introduced to the U.S. in the 1870s. It is frequent in agricultural areas, roadsides, and deserts; it highly favors disturbed sites. Russian thistle can grow to as much as 4 feet in height. Upper leaves have sharp tips and each flower is subtended by 3 spine-tipped leaves, making this a prickly plant to handle, especially as it matures and dries. It is a prolific seed producer, with 1 plant having as many as 100,000 seeds. Russian thistle germinates and grows in several cycles, from late spring through summer, and flowers from mid-summer through early fall. When seeds mature, the entire plant breaks at ground level from its main taproot and 'tumbles' along the ground with the wind, dispersing seed.	This species currently has limited impacts on native vegetation due to its low numbers. If it spreads or increases in density, its negative effects on native plant establishment and growth would increase. Primary impacts to native vegetation would be competition for water, interference with native seed germination and establishment, increased fire return intervals, and altered hydrology, should Russian thistle densities become high. At high densities, Russian thistle reduces ecosystem functioning by increasing the fire return interval, altering hydrology, and lowering habitat value for wildlife by changing habitat structure and displacing plants that are better forage for wildlife.	Late spring: Locate areas of infestation. Late spring/summer: Manual and chemical control will need to be conducted several times as new plants germinate.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Before flowering, young plants can be removed at ground level and left to die in situ. After flowering, plants should be broken off at the base of the plant, immediately bagged, and properly and legally disposed. During transport, care should be taken to prevent the dispersal of seed or any vegetative portion of the plant.	Imazapyr (2-3 pt./ acre) or Glyphosate (4 qt./ acre). Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above. Off-site Imazapyr drift could cause damage to sensitive plant species at distances of less than 900 feet from the application site after both ground broadcast (low boom) at the typical application rate, and possibly at distances greater than 900 feet after applications at the maximum application rate (low to moderate risk for ground applications at both application rates), depending on site-specific conditions. In addition, wind erosion of soil contaminated with imazapyr could lead to adverse effects to sensitive plants, particularly in relatively arid environments. In relatively arid areas in which microbial degradation may be the predominant factor in the decline of imazapyr residuals in soil, residual toxicity to sensitive plant species could last for several months to several years (estimated at 10 months to 5.5 years. Effects to	Glyphosate: see above. Direct spray of imazapic is not likely to pose a risk to terrestrial animals. Therefore, use of imazapic would primarily affect wildlife through habitat modification. Its use could benefit wildlife by controlling invasive plant species and promoting the establishment and growth of native plant species that provide more suitable wildlife habitat and forage (BLM 2007)

						aquatic plants are also plausible and accidental spills pose a high risk to aquatic plants (BLM 2007). Potential impacts to native plants would be avoided or minimized through measures described in Section 7.4 of the IWMP.	
	Mediterranean Grass, Split Grass (*Schismus* spp. including *S. barbatus*) **Cal IPC Rating: Limited**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
Mediterranean grass (*S. barbatus*) and related species are annual grasses is native to Eurasia and Africa. Mediterranean grass was first documented as introduced to Arizona in 1926, but has since become widely established in the southwestern United States. It is particularly well adapted to sandy soils and rapidly establishes in roadsides, fields, and disturbed sites. A study at Joshua Tree National Park found that its growth is enhanced by proximity to the common native desert shrub white bursage (*Ambrosia dumosa*) and that high density may decrease the ability of bursage seed to become established (Rodriquez-Buritica and Miriti, 2009). Mediterranean grass grows in small, tufted clumps, up to 11 inches tall. It has a shallow, fibrous root system. Germination is in early winter, then growth may slow until triggered by increased rainfall or warmer temperatures . It plant can grow rapidly from a seedling to reproductive maturity in as little as 2 weeks.	Widespread throughout the DHSP site at low densities. Current impacts are likely low; however, an increase in its abundance could result in competition for water and may affect native seed germination and establishment. At high density, Mediterranean grass also increases the fuel load and continuity, facilitating more-frequent fires and subsequent type conversion to weedy areas as less fire-tolerant native plants are destroyed. Low-density infestations likely have little impact on wildlife. At high densities, Mediterranean grass reduces ecosystem functioning by increasing the fire return interval, altering hydrology, lowering habitat value for wildlife, and displacing plants that are better forage for wildlife.	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to flowering.	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for new individuals.	Difficult to control manually because of its small size; however, manual removal, with immediate bagging of the entire plant, is the appropriate method for plants that are already in flower.	Glyphosate (1 qt./ acre). Herbicide application results in high mortality if conducted prior to flowering. Refer to specific product labels for proper application rates and restrictions.	Glyphosate: see above.	Glyphosate: see above.
	London Rocket (*Sisymbrium irio*) **Cal IPC Rating: Moderate**						
Description	**DHSP Weed Occurrence and Potential Weed Impacts**	**Treatment Schedule**	**Control Options**			**Potential Herbicide Impacts to Native Vegetation**	**Potential Herbicide Impacts to Wildlife**
			Prevention	**Physical Control**	**Chemical Control**		
London rocket is an annual plant native to southern Europe. It was first reported from Los Angeles, California in the early 1900s. It is	London rocket occurs at low density on the DHSP site and throughout the region. Shaded areas and increased moisture	Winter: Locate areas of infestation. Mid-winter to late spring: Remove or treat all individuals prior to	Minimize the creation of new disturbed areas. Clean vehicles and equipment before entering the project site. Monitor yearly for	Hand-hoeing seedlings or pulling/digging out individual plants is an effective means of controlling this species in areas	Glyphosate (4 qt./ acre maximum). Spray with post-emergent herbicide; after senescence and if seed reached	Glyphosate: see above.	Glyphosate: see above.

naturalized in much of western North America and Mexico and is found in many habitats, such as abandoned fields, waste places, vacant lots, roadsides, orchards, off-highway vehicle staging areas, pastures and livestock watering sites, playas, and open deserts. In desert and semi-desert habitats, it is commonly found along washes in locally dense stands (Halvorson and Guertin, 2003). London rocket is an erect herb that grows to 20 inches tall or more, and is much-branched from near the base of the plant. It has a coarse taproot. In California, germination occurs from October to March, with the plant maturing from April through May (Halvorson and Guertin, 2003).	(through dust control, etc.) are likely to cause increased densities. There is minimal consequence to native vegetation for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat. Primary impacts to native vegetation would be competition for water and interference with native seed germination and establishment, should London rocket densities become high. Low-density infestations likely have little impact on wildlife, but at higher densities London rocket could compete with and reduce the productivity of native plants, thereby altering the availability of forage plants and the characteristics of their habitat structure. It also promotes the spread of fire.	flowering.	new individuals.	where the infestation is small and contained. Any physical removal should be conducted prior to the plant's producing seed. Care must be taken to remove the taproots to prevent regeneration. Any vegetative material should be bagged, carried off-site, and disposed of in a responsible and legal manner to prevent the spread of weeds. Site should be revisited in order to catch later-germinating plants, especially if there have been multiple rain events.	maturity, remove with flail mower and bag for disposal. Refer to specific product labels for proper application rates and restrictions.		

* No distinct populations of any weed species were mapped in the DHSP study area, because all 6 weed species that are present on site are broadly distributed across the site in low to very low densities. There were no areas with weeds dense enough to map as a discrete occurrence, or extensive enough to meet the minimum vegetation mapping unit (approximately 0.15 acre [6,500 square feet]).

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Appendix C

Example California BLM Pesticide Use Proposal

Appendix C
Example California BLM Pesticide Use Proposal

PROPOSAL NUMBER:
REFERENCE NUMBER:

FIELD OFFICE _________ **COUNTY** _________

LOCATION:

____

DURATION OF PROPOSAL:

____

I. PESTICIDE APPLICATION (including mixtures and surfactants):

	Trade Names	Common Names	EPA Registration No.	Manufacturer	Formulations (Liquid or Granular)	Method of Application
1						
2						
3						

MAXIMUM RATE OF APPLICATION:	
USE UNIT ON LABEL:	**POUNDS ACID EQUIVALENT/ACRE:**
1.	1.
2.	2.

INTENDED RATE OF APPLICATION:

APPLICATION DATES:

NUMBER OF APPLICATIONS:

II. PEST (List specific pest(s) and reason(s) for application):

III. MAJOR DESIRED PLANT SPECIES PRESENT:

IV. TREATMENT SITE: (Describe land type or use, size, stage of growth of target species, slope and soil type).

Example California BLM Pesticide Use Proposal

ESTIMATED ACRES

V. SENSITIVE ASPECTS AND PRECAUTIONS: (Describe sensitive areas [e.g., marsh, endangered, threatened, candidate and sensitive species habitat] and distance to treatment site. List measures taken to avoid impact to sensitive areas).

VI. NON-TARGET VEGETATION: (Describe the impacts, cumulative impacts, and mitigations to non-target vegetation that will be lost as a result of this chemical application).

VII. INTEGRATED PEST MANAGEMENT: (Describe how this chemical application fits into your overall integrated pest management program for the treatment area.)

Originator: ______________________ Date: ______________
Company Name: ______________________
Phone: ______________________

Certified Pesticide Applicator:
______________________ Date: ______________
(Signature)

Field Office Pesticide/Noxious Weed Coordinator
______________________ Date: ______________
(Signature)

APPROVALS:
____ Date: ______________
BLM Assistant Field Manager
Renewable Resources
(Signature)

APPROVALS (State Office Use Only):
____ Date: ______________
BLM State Pesticide Coordinator
(Signature)

____ Date: ______________
Deputy State Director, Natural Resources,
Lands and Planning
(Signature)

_CONCUR OR APPROVED
_NOT CONCUR OR DISAPPROVED
_CONCUR OR APPROVED WITH MODIFICATIONS

Appendix D

Example California BLM Pesticide Application Records Form

Appendix D
Example California BLM Pesticide Application Records Form

1. General Information
  a. Project Name: ______________________________________
  b. Operator: ____
  c. Pesticide Use Proposal Number: ________________________
  d. Reference Number: __________________________________

2. Name of Applicator or Employee(s) Applying the Pesticide:
____
____

3. Date(s) of Application: _________ _________ _________
(MONTH, DAY, YEAR)

4. Time Frame of Application: __________________________

5. Location of Application: T______ , R______ , and Sec. ______
County _________________________

6. Type of Equipment Used: ____________________________________
____

7. Pesticide(s) Used: _____________________
Company or Manufacturer's Name: _________________________
____
Trade Name: ____
____

Type of Formulation: Liquid \____/ Granular \____/

8. Rate of Application Used:
a. Active Ingredient per Acre________________________________
b. Volume of Formulation per Acre____________________________

9. Treatment Area
a. Actual Area Treated: ______________________________
b. Total Project Area: ________________________________

10. Primary Pest(s) Involved: _______________________________
____

11. Stage of Pest Development: _____________________________
____

12. Site Treated: \____/ Native Vegetation \____/ Seeded Vegetation \____/ Other

13. Weather Conditions:
a. Wind velocity:_________ b. Wind direction _________ c. Temperature _________

14.Monitoring Record (IF INSUFFICIENT SPACE-CONTINUE ON BACK):

This record is required and must be completed, except for monitoring within 24 hours after completion of application of pesticides. This record must be maintained for minimum of 10 years.

Appendix C.11

Jurisdictional Determination

Jurisdictional Waters/Wetlands Delineation Report
Desert Harvest Solar Project

Prepared for:

enXco Development Corp.
4000 Executive Parkway, Suite 100
San Ramon, CA 94583

Prepared by:

Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

August 2, 2012

Jurisdictional Waters/Wetlands Delineation Report

Desert Harvest Solar Project
Riverside County, California

The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional determination and delineation for the above-referenced project.

Jared Varonin
Associate Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group

August 2, 2012

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  Figure 3. Vegetation: DHSP Site
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  Figure 5. CDFG Jurisdictional Streambeds
  Figure 6. Delineation Transects
Appendix B – Plant Species List
Appendix C – USACE Jurisdictional Determination

Acronyms and Abbreviations

Aspen	Aspen Environmental Group
BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
DHSP	Desert Harvest Solar Project
DSSF	Desert Sunlight Solar Farm
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
gen-tie	Generator tie-line
GIS	Geographic Information System
GPS	Global Positioning System
HA	Hydrologic Area
HR	Hydrologic Region
HU	Hydrologic Unit
LSAA	Lake or Streambed Alteration Agreement
NEPA	National Environmental Policy Act
NRCS	National Resource Conservation Society
NWP	Nationwide Permit
O&M	Operations and Maintenance
OHWM	ordinary high water mark
PV	photovoltaic
RGP	Regional General Permit
SP	Standard Permit
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Water Board	State Water Resources Control Board, Colorado River Basin Region

1.0 Introduction

This report presents the findings of an investigation of jurisdictional features conducted by Aspen Environmental Group (Aspen) for the Desert Harvest Solar Project (DHSP). The DHSP site is located in Riverside County, in the upper Chuckwalla Valley approximately 6 miles north of the rural community of Desert Center (Figures 1 and 2; all figures are located in Appendix A). The assessment of jurisdictional wetlands and other non-wetland Waters of the U.S. was conducted by Aspen Associate Biologist/Ecologist Jared Varonin and Staff Biologists Justin Wood and Dustin Ray during September and October 2011. This assessment determines the extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), State Water Resources Control Board Colorado River Basin Region (Water Board), and the California Department of Fish and Game (CDFG). These are the primary regulating agencies in California for activities within inland streams and wetlands.

1.1 Project Description

The DHSP will be a 150-megawatt solar photovoltaic (PV) generator. The facility would consist primarily of a main generation area of 1,208 acres of BLM lands comprised of two separate parcels separated by Metropolitan Water District land. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres.. The project also includes a generator tie-line (gen-tie) transmission line to deliver power to the Red Bluff Substation, about 12 miles southwest of the DHSP site. This delineation report addresses the proposed solar facility and gen-tie alignment Alternatives B and C as described in the Environmental Impact Statement (EIS).

Solar Facility: The proposed solar facility would consist of several main components, including solar PV arrays, electrical infrastructure, an operations and maintenance (O&M) facility, either on- or off-site, and security such as fencing and lighting. The solar PV arrays would cover the majority of the project area.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a "disc and roll" technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level; as well as "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 1,000 acres.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Access roads 14 to 20 feet wide would run east to west, and 14 foot wide roads would run north to south to allow fire and vehicular access for the maintenance of the electrical facilities.

Vegetation would be allowed to re-grow within the solar panel field. It would not be allowed to grow above 18 inches underneath the panels, to minimize attraction to wildlife, prevent fire hazard, and prevent disruption of panel performance.

O&M activities would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. The access roads would be maintained free from significant vegetation through the use of targeted herbicide application,

Appendices

Appendix A – Figures
- **Figure 1**. Regional Map
- **Figure 2.** Project and Vicinity
- **Figure 3**. Vegetation: DHSP Site
- **Figure 4.** Vegetation: Gen-tie Line Alternatives
- **Figure 5**. CDFG Jurisdictional Streambeds
- **Figure 6.** Delineation Transects

Appendix B – Plant Species List
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enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a "disc and roll" technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level; as well as "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 1,000 acres.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Access roads 14 to 20 feet wide would run east to west, and 14 foot wide roads would run north to south to allow fire and vehicular access for the maintenance of the electrical facilities.

Vegetation would be allowed to re-grow within the solar panel field. It would not be allowed to grow above 18 inches underneath the panels, to minimize attraction to wildlife, prevent fire hazard, and prevent disruption of panel performance.

O&M activities would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. The access roads would be maintained free from significant vegetation through the use of targeted herbicide application, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays. These activities are described in the Draft Integrated Weed Management Plan (DEIS Appendix C.10).

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be longer. Closure strategies may include temporary "mothballing"; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and reclamation of the site to BLM-approved specifications. This Closure and Reclamation Plan is based on the presumption that the site would be fully decommissioned, including removal and demolition of above and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

Gen-tie Line: The proposed gen-tie alignment is described here and in the EIS as Alternative B. The EIS also describes and adjacent gen-tie line, Alternative C, which would be immediately adjacent to the Alternative B alignment. Alternative B, if approved by the BLM, would be built on shared towers with the Desert Sunlight Solar Farm (DSSF) gen-tie line. Alternative C would be built on separate towers in an adjacent ROW. The alignments are shown on Figures 1 and 2. For either alignment, typical spans between poles would be approximately 900 to 1,100 feet. Approximately 73 transmission structures would be built. Ground disturbance would also take place at splicing locations and other work sites during construction. Permanent access roads would be constructed to provide access for maintenance of the gen-tie, as needed. Permanent disturbance for gen-tie construction, O&M, and decommissioning would total approximately 92 acres.

Although the EIS and this Delineation Report conservatively assume construction of gen-tie line Alternative B by enXco under non–cumulative conditions, enXco's proposed gen-tie line would be on a shared ROW with the approved DSSF gen-tie line under cumulative conditions, and would be constructed on the same poles. Stringing of enXco's gen-tie line would take place concurrently with construction of First Solar's gen-tie line if feasible, and would require no additional equipment, personnel, or time beyond that already required and approved for First Solar's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider. Therefore, if the proposed gen-tie alignment Alternative B is adopted by the BLM in the project Record of Decision, there could be no additional ground disturbance for gen-tie construction (if conductors are strung concurrently). If construction is not concurrent, then disturbance would be limited to continued use of the permanent access road and re-disturbance at tower and pull sites.

1.2 Contact Information

Table 1-1 Applicant and Consultant Contact Information

Applicant Contact	Wetland and Biological Consultant
enXco 4000 Executive Parkway, Suite 100 San Ramon, CA 94583 ***Contact:*** Ian Black 925.242.0168 Ian.black@enxco.com	**Aspen Environmental Group** 5020 Chesebro Road, Suite 220 Agoura Hills, CA 91301 ***Contact:*** Jared Varonin 818.338.6715 jvaronin@aspeneg.com

1.3 Site Access

Driving directions to the general area of the DHSP site are provided below:

Table 1-2 Driving Directions to the Project Site

From Interstate 10
From I-10 E take Exit 192 for Desert Center Rice Road/CA-177
Turn north onto CA-177 N/Desert Center Rice Road
Take the 2nd left onto County Route R2/Kaiser Road
Continue on County Route R2/Kaiser Road
Travel approximately 6.0 miles, the southwest corner of the DHSP site is near this location.

2.0 Regulatory Background

Any project-related impacts to jurisdictional waters, wetlands, or riparian habitat could require authorization from the USACE, Water Board, or CDFG. The USACE Regulatory Program regulates activities pursuant to Section 404 of the federal Clean Water Act (CWA); CDFG regulates activities under the Fish and Game Code Section 1600-1607; and the Water Board regulates activities under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. A summary of all three regulatory programs is provided below.

2.1 Section 404 of the Clean Water Act

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within Waters of the U.S. (resulting in more than incidental fallback of material), and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). Waters of the U.S. are defined under the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined under the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." The USACE has adopted several revisions to their regulations in order to more clearly define Waters of the U.S. Until the beginning of 2001, Waters of the U.S. included, among other things, isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable waters.

The jurisdictional extent of USACE regulation changed with the 2001 Solid Waste Agency of Northern Cook County ruling. The Court ruled that the CWA does not extend Federal regulatory jurisdiction over non-navigable, isolated, intra-state waters. However, the Court made it clear that non-navigable wetlands adjacent to navigable waters remain subject to USACE jurisdiction.

Once the limits of USACE jurisdiction are determined and an application is submitted to the USACE, the USACE determines whether or not the proposed activity meets the terms and conditions a Nationwide Permit (NWP), issued by USACE Headquarters for nationwide application, or of a Regional General Permit (RGP), issued by USACE Districts or Divisions. If USACE concludes that a project qualifies under a NWP or a RGP (typically small projects with limited impacts) a letter may be issued verifying compliance with the NWP Program or the applicable RGP. Verification of compliance may be conditioned with specific terms regarding construction protocol, use of best management practices, avoidance of endangered species habitat, and mitigation requirements to ensure that the project will have minimal individual or cumulative impacts to aquatic resources. If a project meets the general terms and conditions of a NWP or RGP, but will result in greater than minimal impacts to aquatic resources on an individual or cumulative basis, the District Engineer may take discretionary authority and require the project to be processed as a Standard Permit (SP). The review process for a NWP or RGP is generally less extensive than for an SP and can often be completed in 30 to 60 days; unless consultation with the U.S. Fish and Wildlife Service (USFWS) is required for effects on federally listed species or designated critical habitat or with the State Historic Preservation Office or sovereign nation for cultural resources listed or eligible for listing on the National Register of Historic Places.

The SP process typically takes 120 days. The USACE decides whether to issue a SP based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity. According to USACE regulations, permits should not be issued for activities that will create “significant” degradation of the Waters of the U.S. or have “significantly adverse effects on wetlands values.”

The evaluation process for an SP is based on guidelines established under Section 404(b)(1) of the CWA and on the “public interest review” procedures. The public interest review involves a broad, qualitative evaluation of a project’s benefits and detriments. USACE regulations have identified 21 factors that are relevant to permit review. These factors are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership, and the general needs and welfare of the people. The public interest review is facilitated by the issuance of a 15 to 30 day Public Notice soliciting comments from the public and from resource agencies such as the USFWS , U.S. Environmental Protection Agency, and Water Board. A public hearing may be held for highly controversial projects.

The Section 404(b)(1) guidelines are often considered the driving force in the USACE permit process. The 404(b)(1) guidelines prohibit discharges of dredged or fill material if there is a less environmentally damaging practicable alternative. Practicability is determined based on technological, economic, social, and logistic considerations. If a project would have significant impacts, attempts must be made to avoid and minimize the impacts. Impacts that cannot be avoided must be mitigated to a level so that net impacts to Waters of the U.S. are not significant. In some cases, projects that would result in significant impacts may be permitted if they provide a substantial benefit to the public, such as projects affecting national security or considerable production of energy.

The USACE must ensure that permitted projects comply with all other applicable federal resource protection laws such as the Endangered Species Act, the National Historic Preservation Act, and the Coastal Zone Management Act. In addition, certification that the proposed activity will comply with all applicable effluent limitations and water quality standards of Section 401 of the CWA is needed prior to issuance of a Section 404 permit. The need for a Section 404 permit constitutes a federal action under the National Environmental Policy Act (NEPA). Therefore, during the review of a proposed project an Environmental Assessment is prepared according to NEPA guidelines. If the impacts of the proposed activity are determined to be significant according to NEPA, an Environmental Impact Statement must be prepared and reviewed according to all NEPA requirements.

If a proposed project complies with all NEPA requirements, Section 404(b)(1) guidelines, is determined not to be contrary to the public interest, and does not violate any federal resource protection laws, the

USACE will issue an SP authorizing the proposed discharge of dredged or fill material into Waters of the U.S. or wetlands. If a proposed project would violate any of the above, then the USACE must deny the Section 404 permit.

2.2 Section 401 of the CWA

Section 401 of the CWA requires that:

> "any applicant for a Federal permit for activities that involve a discharge to 'waters of the State,' shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act."

Therefore, before the USACE will issue a Section 404 permit, an applicant must apply for and receive a Section 401 Water Quality Certification from the Water Board. Applications to the Water Board must include a California Environmental Quality Act (CEQA) review of the project (e.g., Initial Study/Mitigated Negative Declaration). Processing of a water quality certification generally takes 60 days, but the USACE may grant the Water Board time extensions of up to one year. A 21-day public comment period is included in the processing of the Water Quality Certification. The Water Board may add conditions to their certification to remove or mitigate potential impacts to water quality standards. Such conditions must ultimately be included in the Federal Section 404 permit. The State Water Quality regulations contain an "aggrieved party provision" that allows any person or group who objects to the issuance of a Water Quality Certification to petition the Water Board to reconsider the Water Board decision within 30 days of issuance.

Under separate authorities granted by State law (i.e., the Porter-Cologne Water Quality Control Act), a Water Board may choose to regulate discharges of dredge or fill materials by issuing Waste Discharge Requirements, a type of State discharge permit, instead of taking a Water Quality Certification action. Processing of a WDR is similar to that of a Section 401 certification; however, the Water Board has slightly more discretion to add conditions to a project under the Porter-Cologne Water Quality Control Act than under the CWA.

2.3 Section 1602 of the California Fish and Game Code

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project to notify the CDFG of the proposed project if it would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. Notification is generally required for any project site in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. Based on the notification materials submitted, the CDFG will determine if the proposed project may impact fish or wildlife resources.

If CDFG determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (LSAA) will be required. A completed CEQA document must be submitted to the CDFG prior to issuance of a LSAA. The CDFG will propose measures necessary to protect the fish or wildlife impacted within 60 days of receipt of a complete notification package. These measures may be the same as those included as part of the project and/or measures proposed by CDFG. The applicant has 14 days after receiving the proposed measures to provide written notification to CDG of its acceptance, unless the time period is extended by mutual agreement. If the measures are acceptable, the LSAA will be issued. If the measures are not acceptable, the applicant may request a meeting with the CDFG within seven days from the date the CDFG receives the response or by some other mutually agreed upon date for the purpose of developing measures that are acceptable to both the applicant and the CDFG. Once the applicant and CDFG accept or agree on measures necessary to protect fish or wildlife resources, CDFG will incorporate these measures into a draft SAA for review and signature.

3.0 Existing Site Conditions

3.1 Surrounding Land Uses

The area in the vicinity of the DHSP site is largely vacant and undeveloped, and is located in the Chuckwalla Valley of the Sonoran Desert in eastern Riverside County. The existing development in the surrounding area includes the rural community of Desert Center; Lake Tamarisk Desert Resort; the Eagle Mountain Mine; numerous agricultural land uses on private lands throughout the area; the Colorado River Aqueduct and MWD Eagle Mountain Pumping Station; and the DSSF project now under construction immediately north of the DHSP site. Joshua Tree National Park, which is managed by the National Park Service and is largely designated as wilderness, surrounds the upper Chuckwalla Valley to the west, north, and east of the DHSP site.

3.2 Topography

The proposed solar facility site is on the bajada downslope from Eagle Mountains and Coxcomb Mountains, at approximately 600 feet elevation. The northwestern Chuckwalla Valley is a broad alluvial (water transported) system, fed by numerous alluvial fans higher in the watershed. This system flows east and southeast across the site, as a series of many small, braided drainage channels. The site is within a closed basin draining to Palen and Ford Dry Lakes. This is an isolated basin lacking hydrologic connectivity to navigable or interstate waters.

3.3 Climate

The Sonoran (or Colorado) Desert has a typical desert climate, with extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. The Colorado Desert experiences more summer precipitation than the northern deserts, and although annual precipitation is low overall, a substantial portion of it falls during August and September, usually as brief and intense thunderstorms. Average annual rainfall recorded at the Eagle Mountain weather station (Station No. 042598), located approximately 2.5 miles west of the solar facility site, is 3.68 inches (9.35 cm; WRCC, 2012). Average daily summer high temperatures are above 100 degrees Fahrenheit and average daily winter low temperatures are in the 40s.

3.4 Geomorphology/Hydrology

The California Interagency Watershed Mapping Committee has developed a system for naming and delineating watersheds and subunits in California, beginning with 10 Hydrologic Regions (HR) that each covers millions of acres and which are progressively subdivided into Hydrologic Units (HU) and Hydrologic Areas (HA). The DHSP site is located in the Colorado HR, and entirely within the Palen HA subdivision of the Chuckwalla HU. The Chuckwalla HU encompasses 1,268,650 acres, and the Palen HA accounts for 419,660 of these acres, or approximately 33 percent of the larger HU.

For planning and reporting purposes, the Colorado River Basin region is divided into seven major planning areas (Colorado River Basin RWQCB, 2006). The DHSP site is located within the Hayfield Planning Area, which lies primarily in Riverside County and covers approximately 1,190,400 acres (Colorado River Basin RWQCB, 2006).

3.5 Soils

A typical assessment of jurisdictional wetlands and other non-wetland Waters of the U.S. includes a review of historic soil data from the National Resource Conservation Society (NRCS) to determine if and where hydric soils could be present over the site. The DHSP site has not been surveyed by the NRCS so specific soil types are not mapped. Therefore, interpretation of soils on the DHSP site are based on field observations and on soils descriptions from the DSSF project, just north of the DHSP site. That analysis included a 2009 geotechnical study (BLM, 2011). It found that soils were generally uniform and sandy in texture. Soils encountered during the DSSF geotechnical survey of the surrounding area consist of sand dune deposit, younger alluvium, and older alluvium. The older alluvium was slightly moist, likely due to winter rain infiltration and in a medium dense to dense condition, while the sand dune deposits were generally soft and dry (BLM, 2011). Soils in the 2009 geotechnical study exhibited low to very severe resistivity and were classified as having a very low expansion potential (BLM, 2011). Soil textures and vegetation cover are similar on the DHSP site (BLM, 2012).

The DHSP site contains desert pavement (BLM, 2012). Desert pavements are areas with rock fragments of pebble to cobble size that cover an underlying layer of sand, silt, or clay. Desert pavement areas typically have little or no vegetation cover. The extent to which desert pavement reduces wind erosion and resulting fugitive dust depends on the density of the rock fragments covering the underlying soil.

Desert pavements seem to form from two different processes (McAuliffe, 2011). On rocky alluvial fans, fine dust settling out of the air accumulates among the surface layer of rocks, eventually forming a thin silt and clay layer that separates the surface rocks from the main part of the alluvial fan. Desert pavement also forms on sandy soils that contain significant amounts of gravel and rock fragments. In such situations, wind and water erosion can remove most of the sand and fine sediments from the surface, leaving the remaining rock fragments as the predominant surface layer.

3.6 Geology

Regional Geology

The DHSP site lies within the Mojave Desert geomorphic province (BLM, 2012), which is located in the westernmost part of the Basin and Range geomorphic province. This geomorphic province is a broad interior region of isolated mountain ranges separated by expanses of desert plains and is an interior enclosed drainage, with multiple playas (or dry lake basins). The topography is largely a result of fault trends. Mountain ranges in the province are composed of complexly faulted and folded basement rocks that range in age from pre-Cambrian (more than 570 million years before present) to Mesozoic (66 to 240 million years before present). Volcanic and sedimentary rocks deposited in the Cenozoic (less than 66 million years before present to present) are also common. The DHSP site is located in the eastern half of the Mojave Desert geomorphic province where faulting is characterized by generally north- to northwest-trending normal faults associated with regional extension in the Basin and Range province.

The DHSP site lies within the upper Chuckwalla Valley, which is bounded on the northwest by the Eagle Mountains, on the northeast by the Coxcomb Mountains, and on the south by the Chuckwalla Mountains. The Chuckwalla Valley contains a thick sequence of Quaternary sedimentary deposits including Pleistocene fan deposits, Holocene alluvium, and dune sand. The bordering mountains expose primarily Precambrian metamorphic and Mesozoic granitic rocks. The nearest active faults are the north-northwest trending Blue Cut and Pinto Mountain Fault Zones, 11 and 29 miles from the solar facility site, respectively. The San Andreas Fault is approximately 38 miles southwest of the DHSP site (USGS, 2011).

Local Geology

The predominant geologic unit in the DHSP area is Quaternary alluvium and marine deposits (USGS, 2005). No active faults are mapped in the footprint of the DHSP solar facility site or within the Chuckwalla Valley area. The Blue Cut Fault Zone is the closest active fault zone, located approximately 11 miles north of the site (USGS, 2011).

3.7 Vegetation

Aspen biologists mapped vegetation on the DHSP site during September and October 2011. Vegetation on the gen-tie alignments was mapped by Ironwood Consulting for the DSSF Final EIS (FEIS, BLM 2011), and Aspen biologists field-checked that vegetation map as a basis for the DHSP Biological Resources Technical Report (see BLM 2012 Appendix C.6). Two vegetation types cover the solar facility site and gen-tie alignment (Figures 3 and 4): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde–Ironwood Woodland (*Parkinsonia florida–Olneya tesota* Woodland Alliance) as described in Sawyer et al. (2009). The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo Verde–Ironwood Woodland is a subset of Holland's description of "Desert Dry Wash Woodland." There also are small areas where natural vegetation has been removed or disturbed for roads and other land uses but these areas are too small for mapping at this scale.

Creosote Bush Scrub

The Creosote Bush Scrub on the solar facility site is characterized by low diversity of shrub species with relatively wide spacing of shrubs and usually bare ground between the shrubs. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta grass (*Pleuraphis rigida*). This vegetation type also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil's spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory's rock daisy (*Perityle emoryi*).

Blue Palo Verde–Ironwood Woodland

Blue Palo Verde–Ironwood Woodland occurs in patches throughout the DHSP site area, primarily in broad dry washes. This vegetation type is characterized by the presence of desert ironwood (*Olneya* *tesota*) and blue palo verde (*Parkinsonia floridum*). Additional tree species such as smoketree (*Psorothamnus spinosus*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. It is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland, 1986; Schoenherr and Burk, 2007). Vegetation in desert washes is generally taller, reaching up to approximately 9 meters (30 feet) in height in some areas, and denser than those of surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer, 1988). Understory vegetation within these woodlands is composed of species such as big galleta grass, cheesebush (*Hymenoclea salsola*), and desert lavender (*Hyptis emoryi*). Blue Palo Verde–Ironwood Woodlands on the site match the Desert Wash wildlife habitat described by Laudenslayer (1988).

A complete list of all plant species observed within the DHSP site (including wetland indicator status) is presented in Appendix B.

4.0 Waters/Wetlands Delineation

Aspen biologists Jared Varonin, Justin Wood, and Dustin Ray visited the DHSP site during September and October 2011 to conduct a delineation of potentially jurisdictional waters utilizing the methodology described below. The jurisdictional delineation of the gen-tie alignments was completed by Ironwood Consulting for the DSSF FEIS (BLM 2011), and Aspen biologists field-checked that vegetation map as a basis for this Delineation Report and the Biological Resources Technical Report (see BLM 2012 Appendix C.6).

4.1 Federal Delineation Methods: Non-Wetland Waters of the U.S.

Due to the location of the DHSP project site within the closed Palen and Ford Dry Lakes basin and the absence of hydrologic connection to navigable or interstate waters, that the USACE determined that the site is not within the its jurisdiction under Section 404 of the CWA (USACE 2012; Appendix C). Pending receipt of jurisdictional determination from USACE, Aspen proceeded with the delineation of Waters of the U.S., below.

Potential jurisdictional features were evaluated prior to conducting the field assessment by using the vegetation map and descriptions (above), a series of current aerial photographs, detailed topographic maps, the available soils information, and the local and state hydric soil list (NRCS 2011a, 2011b). Additionally, prior to conducting the field assessment, 17 transects (ranging from 0.15 to 1.5 miles in length) were drawn on a one-meter resolution aerial photograph. During the field assessment, points where these transects intercepted potentially jurisdictional waters were mapped on the aerial photographs or with a Trimble GeoXT GPS unit. Field maps were digitized using Geographic Information System (GIS) technology and the total area of jurisdictional features was calculated.

Jurisdictional non-wetland "waters of the U.S." were delineated based on the limits of the ordinary high water mark (OHWM) as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetation characteristics. Criteria used to aid in the determination of the limit and/or presence of the/an OHWM are presented below in Tables 4-1 and 4-2.

Table 4-1 Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West*

Potential Geomorphic OHWM Indicators		
(A) Below OHW	**(B) At OHW**	**(C) Above OHW**
1. In-stream dunes	1. Valley flat	1. Desert pavement
2. Crested ripples	2. Active floodplain	2. Rock varnish
3. Flaser bedding	3. Benches: low, mid, most prominent	3. Clast weathering
4. Harrow marks	4. Highest surface of channel bars	4. Salt splitting
5. Gravel sheets to rippled sands	5. Top of point bars	5. Carbonate etching
6. Meander bars	6. Break in bank slope	6. Depositional topography
7. Sand tongues	7. Upper limit of sand-sized particles	7. Caliche rubble
8. Muddy point bars	8. Change in particle size distribution	8. Soil development
9. Long gravel bars	9. Staining of rocks	9. Surface color/tone
10. Cobble bars behind obstructions	10. Exposed root hairs below intact soil layer	10. Drainage development
11. Scour holes downstream of obstructions	11. Silt deposits	11. Surface relief
12. Obstacle marks	12. Litter (organic debris, small twigs and leaves)	12. Surface rounding
13. Stepped-bed morphology in gravel	13. Drift (organic debris, larger than twigs)	
14. Narrow berms and levees		
15. Streaming lineations		
16. Dessication/mud cracks		
17. Armored mud balls		
18. Knick Points		

* Table adapted from Ironwood, 2010

Table 4-2 Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West*

Potential Vegetation OHWM Indicators			
	(D) Below OHW	**(E) At OHW**	**(F) Above OHW**
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation Annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species

Potential Vegetation OHWM Indicators			
	(D) Below OHW	(E) At OHW	(F) Above OHW
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric Ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

* Table adapted from Ironwood, 2010

4.2 Federal Delineation Methods: Wetlands

This jurisdictional wetland delineation used a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. Data on vegetation, hydrology, and soils were collected using the methods described below and, when necessary, recorded on Wetland Determination Data Forms.

4.2.1 Vegetation

Plant species in each stratum (tree, sapling/shrub, herb, and woody vine) were ranked according to their canopy dominance (USACE 2008). Beginning with the species with the highest coverage, species that contributed to a cumulative coverage total of at least 50 percent and any species that comprised at least 20 percent of the total coverage for each stratum were recorded on the Field Data Sheets (50/20 Rule). The wetland indicator status was assigned to each dominant species using the Region 7 (Southwest Region) and 8 (Intermountain Region) *List of Plant Species that Occur in Wetlands* and *Summary of Wetland Indicator Status* (Reed 1988) and the National *National List of Vascular Plant Species That Occur In Wetlands* (National Wetlands Inventory, 1996). If greater than 50 percent of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation was considered to be met.

Table 4-3 Summary of Wetland Indicator Status

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability of >99%)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability of 67 to 99%)
Facultative	FAC	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34 to 66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67 to 99%)
Obligate Upland	UPL	Almost always occur in non-wetlands (estimated probability >99%)
Non-Indicator	NI	No indicator status has been assigned

An asterisk (*) following the categories noted above indicates limited ecological information is available.
Source: Reed, 1988

4.2.2 Hydrology

The potential presence of wetland hydrology was evaluated by recording the extent of observed primary and secondary indicators (USACE, 2008). Indicators such as, but not limited to, surface water or saturated soils (both Group A indicators) were recorded if observed. The Arid West Supplement includes two additional indicator groups that can be used during dry conditions or in areas where surface water/saturated soils are not present including Group B (evidence of recent inundation) and Group C (evidence of recent soil saturation) (USACE, 2008). The indicators are divided into two categories (primary and secondary indicators) and the presence of one primary indicator from any of the groups is considered evidence of wetland hydrology. These indicators are intended to be one-time observations of site conditions representing evidence of wetland hydrology when hydrophytic vegetation and hydric soils are present (USACE, 2008).

Table 4-4 Wetland Hydrology Indicators *

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	Local Soil Survey Data

* Table adapted from Ironwood, 2010. (Based on 1987 USACE Manual and Related Guidance Documents)

Table 4-5 Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (*any one indicator is sufficient to make a determination that wetland hydrology is present*)	**Secondary Indicator** (*two or more indicators are required to make a determination that wetland hydrology is present*)
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface Water	X	
A2 – High Water Table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	X (Non-riverine)	X (Riverine)
B2 – Sediment Deposits	X (Non-riverine)	X (Riverine)
B3 – Drift Deposits	X (Non-riverine)	X (Riverine)
B6 – Surface Soil Cracks	X	
B7 – Inundation Visible on Aerial Imagery	X	
B9 –Water-Stained Leaves	X	
B10 – Drainage	X	X
B11 – Salt Crust	X	
B12 – Biotic Crust	X	
B13 – Aquatic Invertebrates	X	

	Primary Indicator (*any one indicator is sufficient to make a determination that wetland hydrology is present*)	**Secondary Indicator** (*two or more indicators are required to make a determination that wetland hydrology is present*)
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	X	
C2 – Dry-Season Water Table		X
C3 – Oxidized Rhizospheres along Living Roots	X	
C4 – Presence of Reduced Iron	X	
C6 – Recent Iron Reduction in Tilled Soils	X	
C7 – Thin Muck Surface	X	
C8 – Crayfish Burrows		X
C9 – Saturation Visible on Aerial Imagery		X
Group D – Evidence from other Site Conditions or Data		
D3 – Shallow Aquitard		X
D5 – FAC-Neutral Test		X

* Table adapted from Ironwood, 2010. (Based on Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region, Version 2.0))

4.2.3 Soils

The DHSP site has not been surveyed by the NRCS (mapped as "not completed"); therefore, specific soil types are not known. Analysis for the DSSF just north of the DHSP site included a 2009 geotechnical study (BLM, 2011). On the DSSF site, soil pits were excavated to a depth of 20 inches where possible (USACE, 2008) to record soil texture, color, and any indicators of hydric soils. Data from this study and observations of on-site soil characteristics were used as the basis for evaluating whether hydric/wetland soils are present on the DHSP site. Aspen concludes that soils on the DHSP site are substantially similar to those on the DSSF site.

Table 4-6 Field Indicators of Hydric Soil Conditions*

1. Indicators of Historical Hydric Soil Conditions:	2. Indicators of Current Hydric Soil Conditions:
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix c. Soil colors d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for * 7 continuous days) c. Sulfidic material (rotten egg smell)

* Table adapted from Ironwood, 2010. (Based on 1987 USACE Manual and Related Guidance Documents)

Table 4-7 Hydric Soil Indicators for the Arid West*

Hydric Soil Indicators			Hydric Soil Indicators for Problem Soils**
All Soils	Sandy Soils	Loamy and Clay Soils	
A1 – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Verti
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	--	F7 – Depleted Dark Surface	Other (See Section 5 of the Regional Supplement, Version 2.0)--
A9 – 1 cm Muck	--	F8 – Redox Depressions	--
A11 – Depleted Below Dark Surface	--	F9 – Vernal Pools	--
A12 – Thick Dark Surface	--	--	--

* Table adapted from Ironwood, 2010. (Based on Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region, Version 2.0)

** Indicators of hydrophytic vegetation and wetland hydrology must be present

4.3 CDFG Jurisdictional Waters

State-jurisdictional streambeds were delineated in the field concurrently with the delineation of non-wetland federal waters (Section 4.1, above). Prior to conducting field assessments, 17 transects (ranging from 0.15 to 1.5 miles in length) were drawn on a one-meter resolution aerial photograph. During the field assessment, points where these transects intercepted potentially jurisdictional waters were mapped on the aerial photographs or with a Trimble GeoXT GPS unit. Field maps were digitized using GIS technology and the total area of jurisdictional features was calculated.

CDFG jurisdiction was delineated to the top of the banks of the channel and/or to the edge of the riparian canopy/riparian habitat. For portions of the DHSP site the CDFG jurisdictional boundary mirrors the OHWM. In some areas however the riparian canopy/riparian habitat extends beyond the OHWM. Therefore the total acreage of CDFG jurisdictional waters may be greater than the combined acreage of federal jurisdictional waters/wetlands.

4.4 Results

The only type of jurisdictional feature documented within the DHSP site was CDFG jurisdictional waters. Refer to Table 4-8 and Figure 5 for the locations, widths and acreages of jurisdictional features. Gen-tie line Alternative B (the proposed alternative) would cross similar state-jurisdictional waters, but would not affect wetlands or federally-jurisdictional Waters of the United States. Gen-tie line Alternative C is immediately adjacent to the Alternative B alignment; vegetation and hydrology are essentially the same on both alignments. Construction of either alignment would result in 9 acres of permanent impact to desert dry washes in Creosote desert scrub habitat and 37 acres of desert dry washes in Blue palo verde – Ironwood Woodland habitat (BLM 2011). See Table 4-9.

Table 4-8 – Acreage of Jurisdictional Waters, Wetlands, and CDFG Jurisdictional Habitat on DHSP Solar Facility Site

	Total Length (ft)	CDFG Jurisdictional Waters (Acres)		USACE/Water Board Waters and Wetlands (Acres)	
		Non-wetland CDFG Jurisdictional Waters	Wetlands	Non-wetland "Waters of U.S."	Wetlands
Solar Facility	540,278	285.5	0.0	0.0	0.0

Table 4-9 – Acreage of Jurisdictional Waters, Wetlands, and CDFG Jurisdictional Habitat on Gen-tie Alignment Alternatives B and C

	Habitat Type	CDFG Jurisdictional Waters (Acres)		USACE/Water Board Waters and Wetlands (Acres)	
		Non-wetland CDFG Jurisdictional Waters	Wetlands	Non-wetland "Waters of U.S."	Wetlands
Gen-tie Alternatives B and C	Desert Dry Wash – Creosote Bush Scrub	9	0.0	0.0	0.0
	Desert Dry Wash - Woodland	37	0	0	0
	Total	46	0	0	0

Table adapted from Desert Sunlight Solar Farm Project Final EIS and CDCA Plan Amendment, 2011

4.4.1 Federal Non-Wetland Waters of the U.S.

Due to the location of the DHSP project site within the closed Palen and Ford Dry Lakes basin and the absence of hydrologic connection to navigable or interstate waters, Aspen believes that the site is not within the USACE jurisdiction under Section 404 of the CWA. The USACE has provided its written jurisdictional determination for the DHSP site (29 May 2012; Appendix C) agreeing that the site it outside federal jurisdiction under Section 404 of the CWA.

4.4.2 Federal Wetlands

Although the site is outside federal jurisdiction under Section 404 of the CWA, Aspen completed its evaluation of any potential wetlands or wetland indicators in order to inform the CDFG's evaluation of the site and as a basis for evaluating impacts under NEPA and CEQA (BLM 2012).

Vegetation

Based on field observations, a dominance of wetland plant species or hydrophytes was not found; therefore, the criteria defined by the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) for wetland vegetation was not met.

Soils

Based on field observations, indicators of hydric soils were not observed; therefore, the criteria defined by the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) for hydric soils were not met. Observations of soils within the DHSP site did not reveal evidence of ponding or soil saturation. The lack of evidence of ponding or soils saturation correlates with the nature of the soils known to occur in the area.

Hydrology

No wetland hydrology indicators were observed; therefore, the criteria defined by the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) for wetland hydrology were not met. The lack of evidence of ponding or soils saturation correlates with the nature of the soils occurring in the area.

Based on assessment of hydrology, vegetation and soils during the field surveys and in Aspen's professional opinion, none of the habitat within the DHSP site satisfies the criteria as wetlands pursuant to the USACE 1987 Manual and 2008 Regional Supplement. This conclusion is dependent on confirmation by the USACE.

4.4.3 CDFG Jurisdictional Waters

Construction of the DHSP solar facility would impact 113 acres of CDFG jurisdictional streambeds including 34.5 acres within Blue Palo Verde–Desert Ironwood Woodland and 78.5 within Creosote Bush Scrub (see Figure 5). Construction would also impact 180 acres of the adjacent riparian vegetation (Blue Palo Verde–Desert Ironwood Woodlands; see Figure 3). Total impacts to CDFG jurisdictional areas are calculated as the sum of mapped woodlands (180 acres) plus the acreage of CDFG jurisdictional waters mapped outside those woodlands (78.5 acres), or 258.5 acres. For portions of the DHSP site, the CDFG jurisdictional boundary mirrors the OHWM. However, in most areas, the riparian canopy and/or riparian habitat extend beyond the OHWM. In addition, approximately 46 acres of state jurisdictional waters and adjacent riparian vegetation would be affected by construction of gen-tie Alternatives B or C. Based on assessment of hydrology, presence of bed and bank, extent of microphyll woodland (Blue Palo Verde–Desert Ironwood Woodlands) vegetation, and in Aspen's professional opinion, the total project impacts to CDFG jurisdictional waters and adjacent riparian vegetation as outlined in Sections 1600-1616 of the California Fish and Game Code would be 304.5 acres. This total includes 46 acres of gen-tie impacts that may not be disturbed by the DHSP, depending on the final project alternative identified in the BLM Record of Decision and on scheduling for gen-tie line construction.

5.0 Summary and Conclusions

All of the jurisdictional streambeds mapped within the DHSP site are characterized as ephemeral desert dry washes. These washes exhibited field indicators of active flow such as, but not limited to, water marks, linear deposits of sediment and/or plant debris, bank scour, and erosion. Aspen determined CDFG jurisdictional waters and adjacent riparian vegetation are found on the site, but that USACE Jurisdictional Waters of the U.S. and Water Board jurisdictional waters are not found on the DHSP site. Using a combination of vegetation mapping, bed/bank delineation, and other field observations approximately 258.5 acres of CDFG jurisdictional area were delineated within the DHSP site. Based on the DSSF FEIS (BLM 2011) an additional 46 acres of state-jurisdictional waters and adjacent riparian vegetation would be affected by construction of gen-tie line Alternatives B or C.

No portion of the DHSP site supported hydrophytic vegetation, exhibited evidence of wetland hydrology, or hydric soils, and no portion of the site meets state or federal criteria as wetlands. Although evidence of hydrology or a discernible OHWM was visible within the mapped ephemeral desert dry washes, the site does not contain jurisdictional Waters of the U.S. as defined in 33 CFR Part 328. This determination was based on the site's location within the closed Palen and Ford Dry Lakes basin and the absence of hydrologic connection to navigable or interstate waters, as confirmed by USACE (Appendix C).

The conclusions presented above represent Aspen's professional opinion based on knowledge and experience with the USACE, Water Board and CDFG, including their regulatory guidance documents and manuals. However, the USACE, Water Board and CDFG have final authority in determining the status and presence of jurisdictional wetlands/waters and the extent of their boundaries.

6.0 References

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Appendix A: Figures

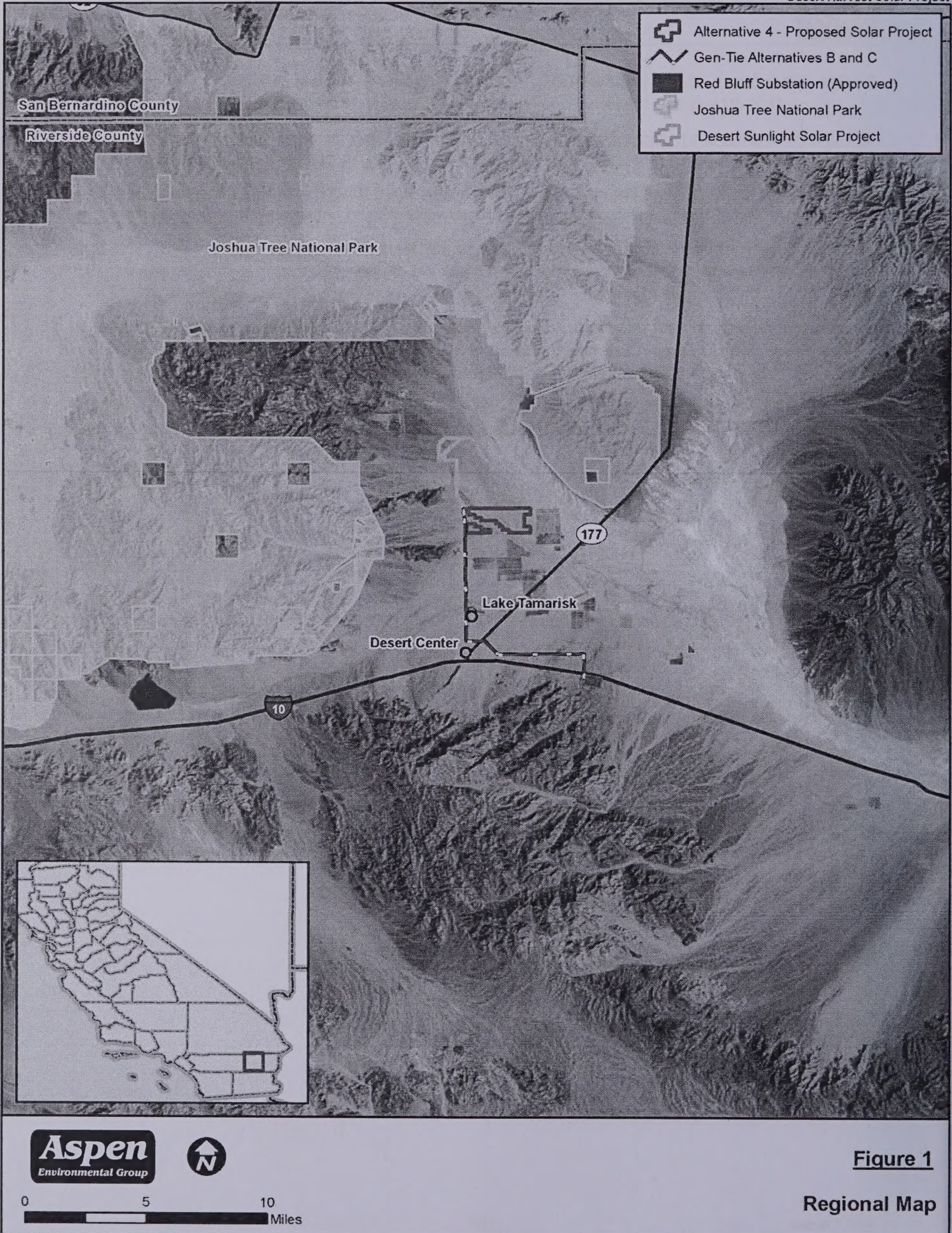
Alternative 4 - Proposed Solar Project
Gen-Tie Alternatives B and C
Red Bluff Substation (Approved)
Joshua Tree National Park
Desert Sunlight Solar Project
San Bernardino County
Riverside County
Joshua Tree National Park
177
Lake Tamarisk
Desert Center
10
Aspen
Environmental Group
N
0
5
10
Miles

Figure 1

Regional Map

August 2012

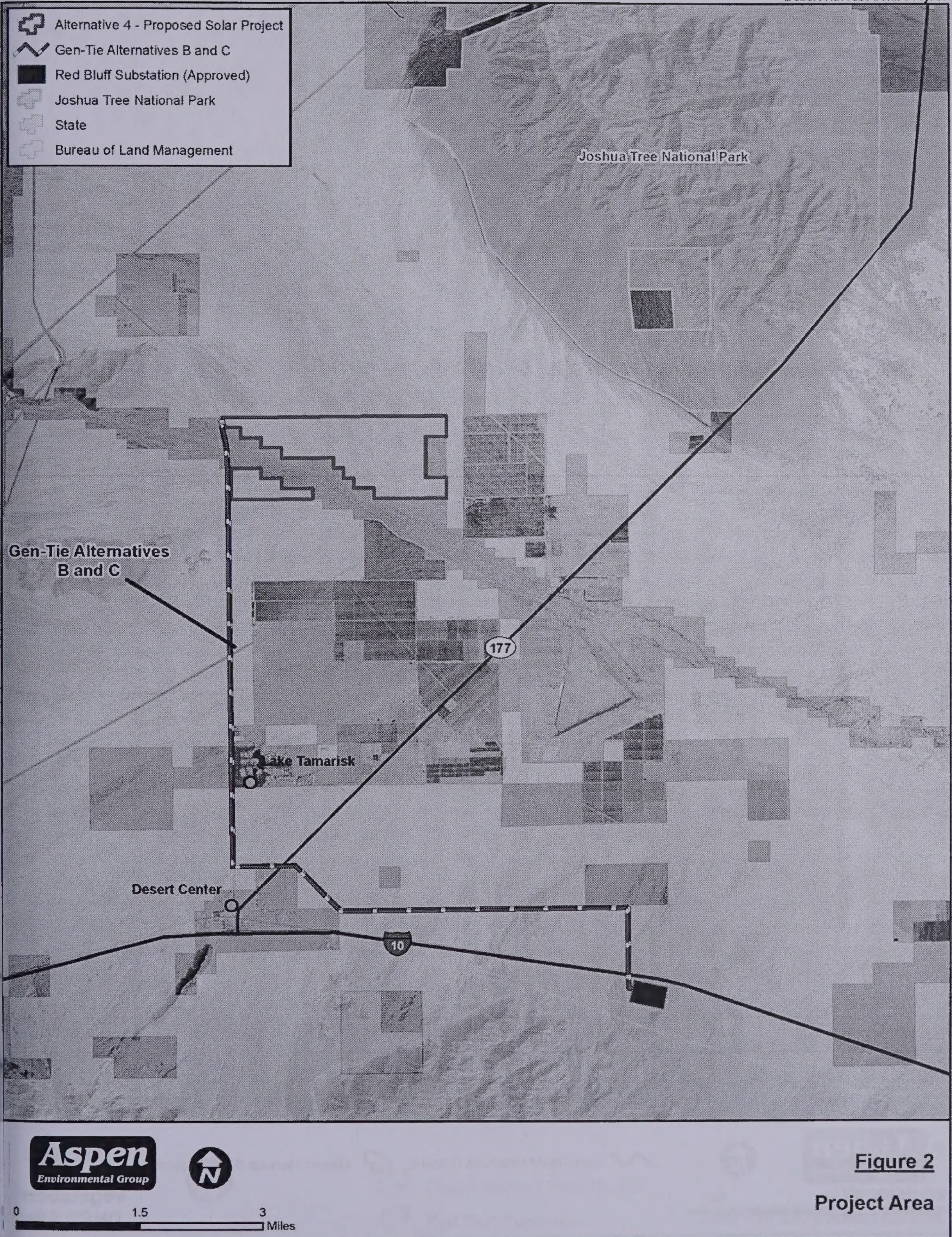
Alternative 4 - Proposed Solar Project
Gen-Tie Alternatives B and C
Red Bluff Substation (Approved)
Joshua Tree National Park
State
Bureau of Land Management
Joshua Tree National Park
Gen-Tie Alternatives B and C
177
Lake Tamarisk
Desert Center
10
Aspen Environmental Group
N
0
1.5
3
Miles

Figure 2

Project Area

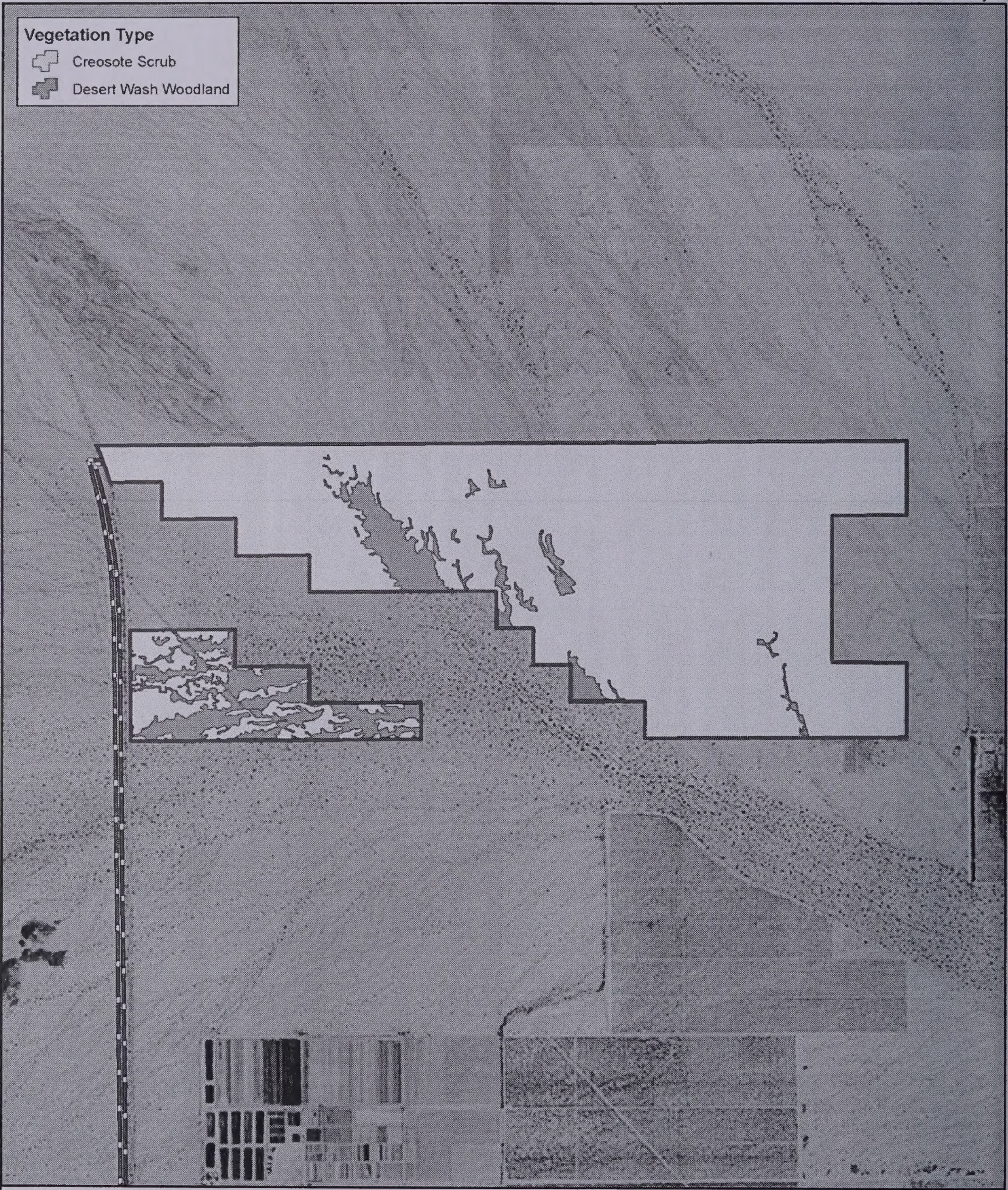
Vegetation Type
Creosote Scrub
Desert Wash Woodland
Aspen Environmental Group
N
0
0.2
0.4
0.8
Miles
Gen-Tie Alternatives B and C
Desert Harvest Solar Project

Figure 3

**Vegetation
DHSP Site**

August 2012

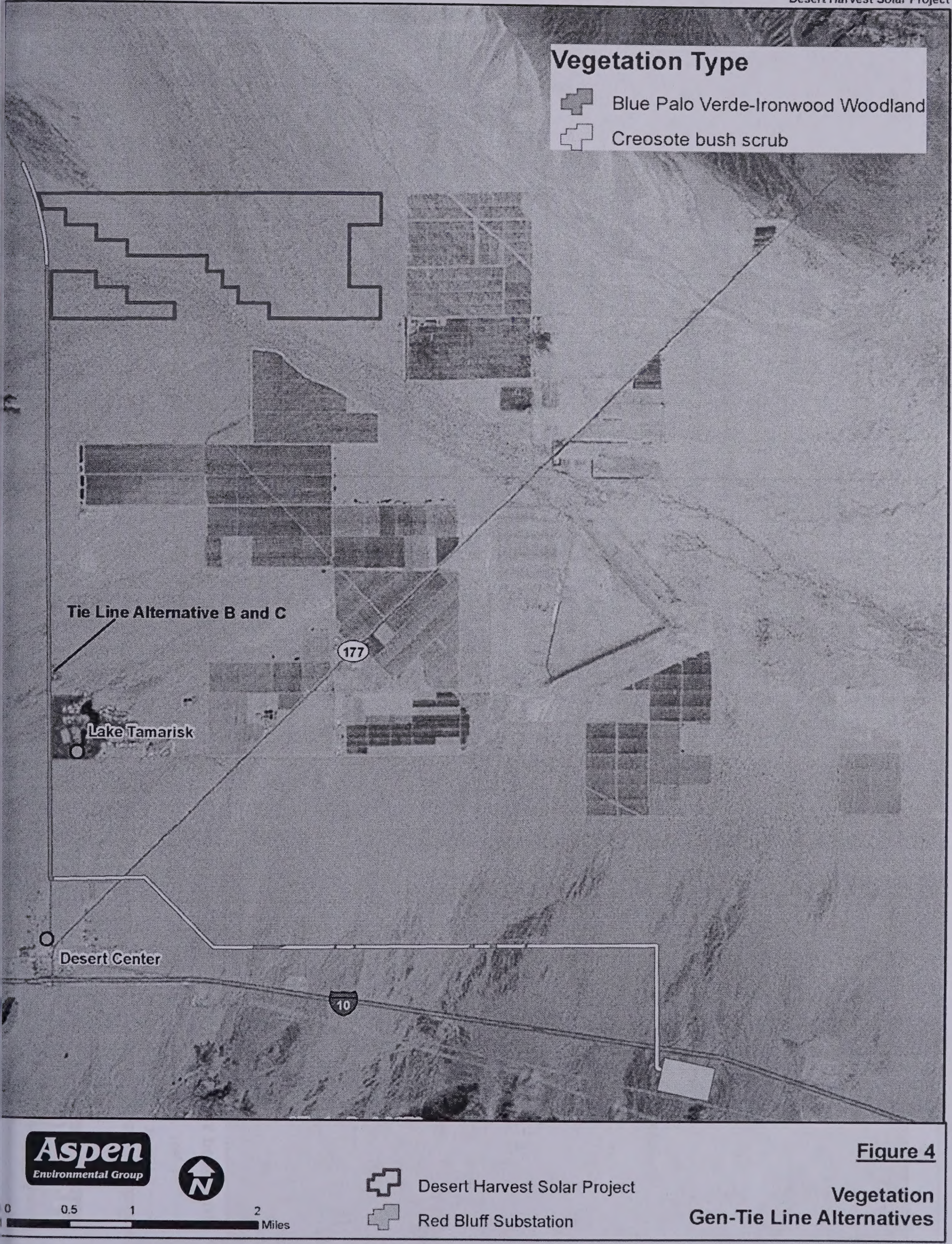

Figure 4

Vegetation
Gen-Tie Line Alternatives

August 2012

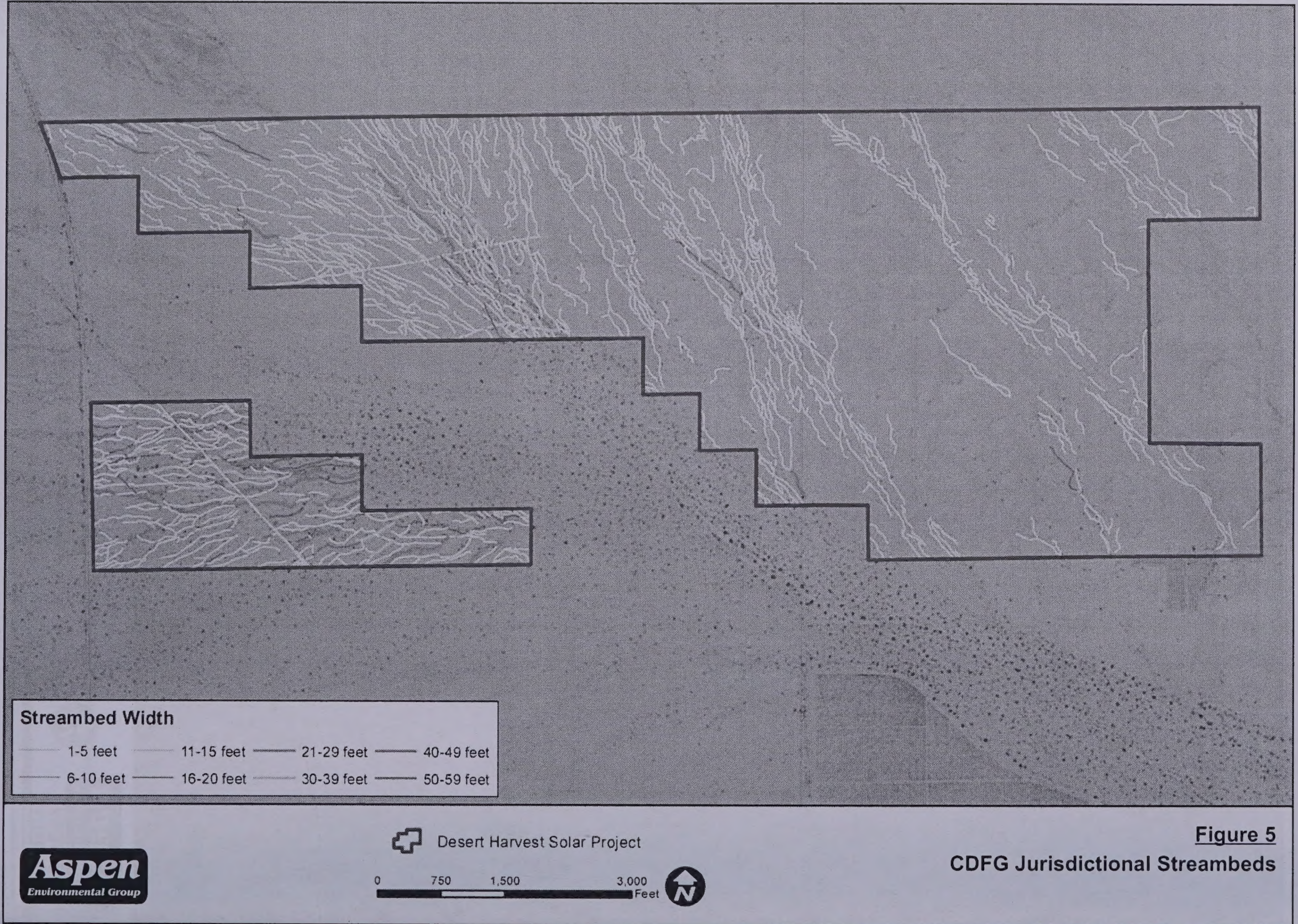

Figure 5
CDFG Jurisdictional Streambeds

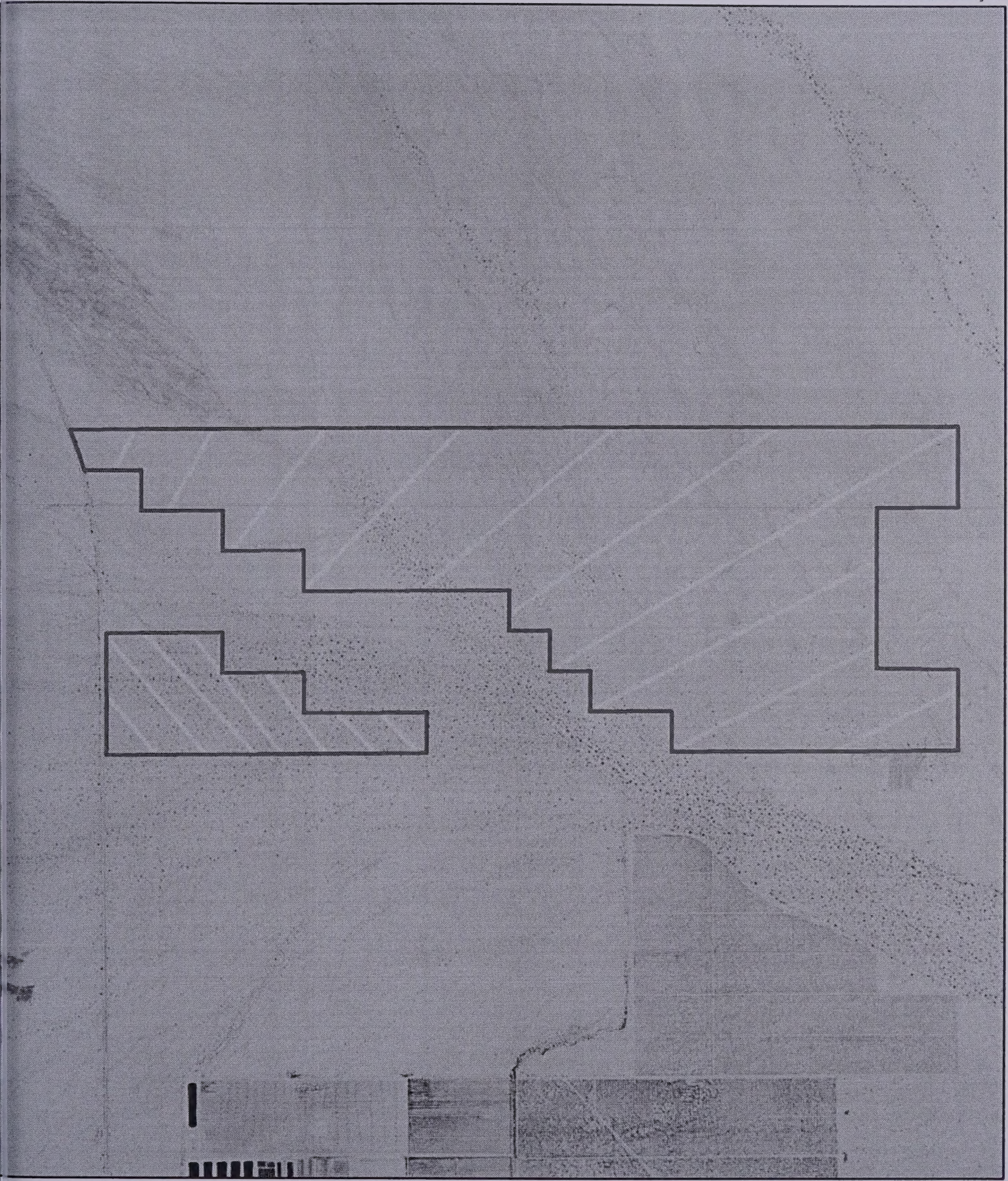

Figure 6

Jurisdicitonal Waters and Wetland Delineation Transects

August 2012

Appendix B: Plant Species Observed on the Project Site

Latin Name	Common Name	Abundance	Wetland Indicator Status***
VASCULAR PLANTS			
AMARANTHACEAE	AMARANTH FAMILY		
Tidestromia oblongifolia	Honeysweet	Uncommon	--
(T. suffriticosa var. oblongifolia)			
ASCLEPIADACEAE	MILKWEED FAMILY		
Asclepias erosa	Desert milkweed	Uncommon	--
Asclepias subulata	Rush milkweed	Uncommon	--
# *Cynanchum utahense*	Utah milkvine	Solitary	--
(Funastrum utahense)			
Sarcostemma hirtellum	Rambling milkvine	Scarce	--
ASTERACEAE	ASTER FAMILY		
Ambrosia dumosa	White bursage, burrobush	Common	--
Bebbia juncea	Sweetbush	Uncommon	--
Calycoseris wrightii	White tackstem	Scarce	--
Chaenactis carphoclina	Pincushion	Uncommon	--
Chaenactis fremontii	Fremont pincushion	Occasional	--
Chaenactis stevioides	Broad-flowered pincushion	Uncommon	--
Encelia actoni	*Acton brittlebush*	Uncommon	--
Encelia farinosa	*Brittlebush*	Occasional	--
Encelia frutescens	*Rayless encelia*	Occasional	--
Geraea canescens	*Desert sunflower*	Uncommon	--
Hymenoclea salsola	*Cheesebush*	Occasional	UPL
Malacothrix glabrata	Desert dandelion	Common	--
Monoptilon bellioides	Desert star	Uncommon	--
Palafoxia arida	Spanish needles	Common	--
Pectis papposa	Chinchweed	Occasional	--
Perityle emoryi	Emory rock-daisy	Occasional	--
Psathyrotes ramosissima	Velvet rosettes	Uncommon	--
Rafinesquia neomexicana	Desert chicory	Uncommon	--
Stephanomeria exigua	Small wreath-plant	Scarce	--
Stephanomeria pauciflora	Desert straw	Uncommon	--
BORAGINACEAE	BORAGE FAMILY		
Amsinckia tessellata	Checker fiddleneck	Uncommon	--
Cryptantha angustifolia	Narrowleaf cryptantha	Occasional	--
Cryptantha barbigera	Bearded cryptantha	Uncommon	--
# *Cryptantha dumetorum*	Twining cryptantha		--
Cryptantha maritima	White Haired Forget me not	Uncommon	--
Cryptantha nevadensis	Nevada cryptantha	Uncommon	--

Latin Name	Common Name	Abundance	Wetland Indicator Status***
# *Pectocarya platycarpa*	Broad-fruited comb-bur		--
Pectocarya recurvata	Recurved pectocarya	Scarce	--
Tiquilia plicata (Coldenia plicata)	Plicate tiquilia	Scarce	--
BRASSICACEAE	MUSTARD FAMILY		
* *Brassica tournefortii*	Sahara mustard, wild turnip	Uncommon	--
Dithyrea californica	California spectacle pod	Scarce	--
Lepidium lasiocarpum	Sand peppergrass	Uncommon	--
* *Sisymbrium irio*	London rocket	Scarce	--
CACTACEAE	CACTUS FAMILY		
Ferocactus cylindraceus	California barrel cactus	Scarce	--
Opuntia basilaris v. basilaris	Beavertail cactus	Scarce	--
Cylindropuntia echinocarpa	Silver cholla	Scarce	--
Cylindropuntia ramosissima	Pencil cholla	Scarce	--
CARYOPHYLLACEAE	CARNATION FAMILY		
Achyronychia cooperi	Onyx flower	Scarce	--
CHENOPODIACEAE	GOOSEFOOT FAMILY		
# *Chenopodium sp.*	Unidentified goosefoot		--
CUCURBITACEAE	GOURD FAMILY		
Brandegea bigelovii	Brandegea	Occasional	--
CUSCUTACEAE	DODDER FAMILY		
Cuscuta denticulata	Dodder (parasite on creosote)	Scarce	--
EUPHORBIACEAE	SPURGE FAMILY		
# *Chamaesyce albomarginata*	Rattlesnake spurge		--
(Euphorbia albomarginata)			
Chamaesyce micromera	Sonoran sandmat	Occasional	--
(Euphorbia micromera)			
Chamaesyce polycarpa	Sand mat	Occasional	--
(Euphorbia polycarpa)			
Croton californicus	California croton	Uncommon	--
Ditaxis lanceolata	Narrow-leaved ditaxis	Scarce	--
Ditaxis neomexicana	Common ditaxis	Occasional	--
Ditaxis serrata	Yuma ditaxis	Occasional	--
(Ditaxis serrata var. serrata)			
# *Stillingia linearifolia*	Linear-leaved stillingia		--
Stillingia spinulosa	Annual stillingia	Uncommon	--
FABACEAE	PEA FAMILY		
Acacia greggii	Catclaw acacia	Uncommon	FACU

	Latin Name	Common Name	Abundance	Wetland Indicator Status***
	Dalea mollissima	Rust dalea	Occasional	--
	Lupinus arizonicus	Arizona lupine	Occasional	--
#	*Lupinus sp.*	Unid. annual lupine		--
	Marina parryi	Parry dalea	Scarce	--
	Olneya tesota	Desert ironwood	Abundant	--
	Parkinsonia florida	Blue palo verde	Occasional	UPL
	Psorothamnus emoryi	Emory indigo-bush, dye-weed	Uncommon	--
	(Dalea emoryi)			
	Psorothamnus schottii	Indigo-bush	Uncommon	--
	(Dalea schottii)			
FOUQUIERIACEAE		OCOTILLO FAMILY		
	Fouquieria splendens	Ocotillo	Scarce	--
HYDROPHYLLACEAE		WATERLEAF FAMILY		
	Phacelia distans	Common heliotrope	Uncommon	--
	Phacelia crenulata	Helitrope phacelia	Scarce	--
KRAMERIACEAE		KRAMERIA FAMILY		
	Krameria erecta	Pima rhatany, purple heather	Uncommon	--
	(K. parvifolia)			
	Krameria grayii	White rhatany	Occasional	--
LAMIACEAE		MINT FAMILY		
	Hyptis emoryi	Desert lavender	Scarce	--
	Eremalche rotundifolia	Desert fivespot	Scarce	--
	Salvia columbariae	Chia	Uncommon	--
MARTYNIACEAE		UNICORN PLANT FAMILY		
**	*Proboscidea althaeifolia*	Unicorn plant	Uncommon	--
MOLLUGINACEAE		CARPETWEED FAMILY		
*	*Mollugo cerviana*	Carpet weed	Scarce	NI
NYCTAGINACEAE		FOUR O'CLOCK FAMILY		
#	*Abronia villosa var. villosa*	Sand verbena		--
	Allionia incarnata	Trailing windmills	Scarce	--
ONAGRACEAE		EVENING PRIMROSE FAMILY		
	Camissonia boothii	Desert primrose	Scarce	--
	ssp. condensata			
	Camissonia boothii	Desert primrose	Scarce	--
	ssp. desertorum			
	Camissonia claviformis	Clavate evening primrose	Scarce	--

Latin Name	**Common Name**	**Abundance**	**Wetland Indicator Status***
PAPAVERACEAE	POPPY FAMILY		
# *Eschscholzia minutiflora*	Small-flowered poppy		--
PLANTAGINACEAE	PLANTAIN FAMILY		
Plantago ovata	Desert plantain	Uncommon	FACU
POLEMONIACEAE	PHLOX FAMILY		
# *Gilia latifolia*	Broad-leaved gilia		--
Gilia sp.	Unid. Gilia	Uncommon	--
Loeseliastrum schottii	Schott's langloisia	Scarce	--
POLYGONACEAE	BUCKWHEAT FAMILY		
Chorizanthe brevicornu	Brittle spine-flower	Uncommon	--
# *Chorizanthe corrugata*	Wrinkled spineflower		--
Chorizanthe rigida	Rigid spine-flower	Occasional	--
Eriogonum deflexum	Skeleton weed	Occasional	--
Eriogonum nidularium	Birdnest buckwheat	Scarce	--
Eriogonum pusillum	Puny buckwheat	Uncommon	--
Eriogonum reniforme	Kidney-leaved buckwheat	Uncommon	--
PORTULACACEAE	PURSLANE FAMILY		
Calyptridium monandrum	Common calyptridium	Uncommon	--
RESEDACEAE	MIGNONETTE FAMILY		
# *Oligomeris linifolia*	Narrowleaf oligomeris		--
SIMAROUBACEAE			
** *Castela emoryi*	Crucifixion thorn	Uncommon	--
SOLANACEAE	*NIGHTSHADE FAMILY*		
Datura discolor	Jimsonweed, desert thorn-apple	Occasional	--
Physalis crassifolia	Thick-leaf ground cherry	Scarce	--
VISCACEAE	MISTLETOE FAMILY		
Phoradendron californicum	Desert mistletoe	Scarce	--
ZYGOPHYLLACEAE	CALTROP FAMILY		
Fagonia laevis	Smooth-stem fagonia	Uncommon	--
# *Fagonia pachyacantha*	Glandular fagonia		--
Kallstroemia californica	California caltrop	Uncommon	--
Larrea tridentata	Creosote bush	Abundant	--
# *Tribulus terrestris*	Puncture vine		-

Latin Name	**Common Name**	**Abundance**	**Wetland Indicator Status*** **
ARECACEAE	PALM FAMILY		
Phoenix dactylifera	Date palm	Scarce	-
LILIACEAE	LILY FAMILY		
# *Calochortus sp.*	Unid. Mariposa lily		--
Hesperocallis undulata	Desert lily	Uncommon	--
POACEAE	*GRASS FAMILY*		
Aristida adscensionis	Six-weeks three-awn grass	Scarce	--
Aristida californica	California three-awn	Uncommon	--
Aristida purpurea	Three-awn grass	Scarce	--
Bouteloua aristidoides	Needle grama	Uncommon	--
Pleuraphis rigida (Hilaria rigida)	Big galleta	Occasional	--
* *Schismus arabicus*	Arabian schismus	Uncommon	--
* *Schismus barbatus*	Mediterranean schismus	Uncommon	--

* *Alien species indicated by asterisk*

** *Special status species indicated by two asterisks.*

*** *Refer to Table 4-3 for a full description of the wetland indicator status categories.*

# *These species were observed during botanical surveys conducted by AMEC in 2010; these species were not observed during Aspen's survey in 2011.*

-- *A wetland indicator status has not been assigned to these species.*

This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season (many plants are identifiable only in spring). Plants were identified using keys, descriptions, and illustrations in Baldwin et al. (2002), and Munz (1974). Taxonomy and nomenclature generally follow Baldwin et al. (2002).

Appendix C: Correspondence with USACE

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
RIVERSIDE FIELD OFFICE
1451 RESEARCH PARK DRIVE, SUITE 100
RIVERSIDE, CALIFORNIA 92507-2154

May 29, 2012

REPLY TO
ATTENTION OF
Regulatory Division

Jared Varonin
Aspen Environmental Group
30423 Canwood Street, Suite 215
Agoura Hills, California 91301

SUBJECT: Approved Jurisdictional Determination regarding absence of geographic jurisdiction for Desert Harvest Solar Project (SPL-2012-00359-JEM), Desert Center, Riverside County, CA

Dear Mr. Varonin:

Reference is made to your request (File No. SPL-2012-00359-JEM) dated January 24, 2012, for an approved Department of the Army jurisdictional determination (JD) for the Desert Harvest Solar Project, near Desert Center, Riverside County, California (location approximately centered at -115.37687 Longitude 33.79784 Latitude, NAD 83).

As you know, the Corps' evaluation process for determining whether or not a Department of the Army permit is needed involves two tests. If both tests are met, then a permit is required. The first test determines whether or not the proposed project is located in a water of the United States (i.e., it is within the Corps' geographic jurisdiction). The second test determines whether or not the proposed project is a regulated activity under Section 10 of the River and Harbor Act or Section 404 of the Clean Water Act. As part of the evaluation process, pertaining to the first test only, we have made the jurisdictional determination below.

Based on available information, we have determined there are aquatic resources present at the proposed project site, but there are no waters of the United States on the proposed project site.

The aquatic resources identified at the proposed location are intrastate isolated waters, with no apparent interstate or foreign commerce connection. As such, these waters are not currently regulated by the Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Clean Water Act. Other Federal, State, and local laws may apply to your activities. In particular, you may need authorization from the California State Water Resources Control Board and/or the U.S. Fish and Wildlife Service.

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. If you wish to submit new information regarding the approved jurisdictional determination for this site, please submit this information to me at the letterhead address by **July 29, 2012**. The Corps will consider any new information so submitted and respond within 60 days by either revising the prior determination, if appropriate, or reissuing the prior determination.

This determination has been conducted to identify the extent of the Corps' Clean Water Act jurisdiction on the particular project site identified in your request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

If you have any questions, please contact me at 951-276-6624 x 263 or via e-mail at James.E.Mace@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

James E. Mace
Senior Project Manager
Orange-Riverside Section

Appendix C.12

Applicant Memo on Mitigation Land

WILDLANDS

TO: Ian Black, enXco

FROM: Brian Monaghan, Wildlands Bri

DATE: November 17, 2011

RE: Desert Harvest Solar Project, Riverside County

Thank you for the opportunity to work with enXco on providing a turnkey private lands habitat mitigation portfolio for the Desert Harvest solar project. Based on our current lands portfolio and knowledge of suitable private lands available, Wildlands is confident we can develop a Formal Mitigation Acquisition Proposal sufficient to meet the specific habitat mitigation permit conditions required by the natural resource agencies including but not limited to U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and California Department of Fish and Game.

Wildlands is currently working to develop a private lands mitigation portfolio for the project in anticipation of a formal purchase and sale agreement between Wildlands and enXco. We look forward to finalizing an agreement and presenting enXco with a full delivery solution in a timeframe that meets the conditions of the various Desert Harvest project permits.

Thank you again for the opportunity to work with enXco.

WILDLANDS ◆ 3855 Atherton Road ◆ Rocklin, CA 95765 ◆ p: 916.435.3555 ◆ f: 916.435.3578

Appendix C.13

Mojave Fringe-toed Lizard Habitat Assessment

Mojave Fringe-toed Lizard *Uma scoparia* Habitat Assessment

enXco Desert Harvest Solar Energy Project

Prepared for:
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Prepared by:
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INTRODUCTION

This report addresses the results of the Mojave fringed-toed lizard (MFTL) habitat assessment on the proposed Desert Harvest solar project site near Desert Center California. Habitat within the project site boundaries and the solar footprint was observed to see what if any was suitable for the Mojave Fringe-toed Lizard.

Mojave fringe-toed lizard (*Uma scoparia*)

Mojave fringe-toed lizards occur in the lower Sonoran life zones of the Mojave Desert and the northwestern reaches of the Sonoran desert (Hollingsworth and Beaman et al. 1999). The Mojave fringe-toed lizard is found inn arid, sandy, sparsely vegetated habitats, within the broader matrix of creosote bush scrub, throughout much of its range (Norris 1958). The most important factor in its habitat is the presence of fine sands, but it also uses surrounding desert habitat. It is restricted to habitats where fine loose, aeolian (windlblown) sand, typically with grain size no coarser than 0.375 mm in diamater and at least a few inches deep, is abailable (Stebbins 1944; Turner et al. 1984). They also may be found in surrounding habitat as far as at least 45 M from aeolian sand deposits (Norris 1958).

Methodology

As an experienced MFTL surveyor I conducted the habitat assessment with assistance from S. White and D. Ray by walking and driving to precise coordinates to analyze and photograph the habitat of the project sites on 2/25/2011, 3/05/2011 and 3/12/2011. Starting at the larger northern project site coordinates were plotted north, south, east and west boundaries. Alluvial fan desert scrub habitat was observed while walking. Several washes that produced loose sand were checked for sand grain size consistency, sand depth and MFTL tracks and other sign.

Summary of Conclusions

The Desert Harvest project site does not appear to provide suitable habitat for Mojave fringe-toed lizard. Ephemeral washes and channels throughout the site provide alluvial sand habitats but were often cemented or compacted, and the sand depth and coarse texture was not conducive for MFTL occupancy. The few isolated areas where deeper, loose sand was present were not large enough to support MFTL occupancy. No MFTL or their sign was observed throughout the field survey, though temperatures and times were suitable for their activity.

Northern Project Site

The Northern project site is primarily characterized by alluvial fan desert scrub with some Ironwood trees along its southern boundary. Several moderate to light alluvial channels pass through it. The exposed base substrate is largely a mix of cemented sand or gravel and where loose sand was present within the washes, sand depth and consistency was not conducive for MFTL occupancy.

3348095 N, 11524184 W, Point (1) The northwestern boundary west of Kaiser Road. This region has light alluvial braiding within its desert scrub makeup however none of these braids had any fine sand depth or conistency for MFTL occupancy.

Facing N

Facing E

3348095 N, 11524058 W, Point (2) The northern boundary east of Kaiser Road. This region is alluvial fan desert scrub with a mix of moderate and light alluvial braiding. The moderate braids running northwest to southeast closer to Kaiser Road had some finer aeolian sand deposits but most of these were cemented and lacked the necessary depth conducive for MFTL occupancy.

Facing N

Facing S

3348095N, 11523377 W, Point (3) This region is alluvial fan desert scrub with several shallow and narrow alluvial braids. Habitat between these shallow braids is course gravel and where fine aeolian sand deposits exist they lack enough depth for MFTL occupancy.

Facing N

Facing S

3348095 N, 11523058 W, Point (4) This region is alluvial fan desert scrub with several faint alluvial braids. Much of this region is peppered with a thin layer of aeolian sand and just below it is an exposed base substrate of gravel This region is not conducive for MFTL occupancy.

Facing N

Facing S

3348094 N, 11522343 W, Point (5) This regions is alluvial fan desert scrub with a few wider washes, however, they lack any depth and the majority of the sand is too compacted for MFTL occupancy.

Facing N

Facing S

3348094 N, 11522031 W, Point (6) This region is alluvial fan desert scrub with much of the region having an exposed base substrate of gravel and cemented sands. Very few alluvial braids were present. This region is not conducive for MFTL occupancy.

Facing N

Facing S

3348093 N, 11521308 W, Point (7) The northeastern boundary. This region is alluvial fan desert scrub with very faint alluvial braiding. This region is largely made up of an exposed base substrate of gravel and cemented sands. This region is not conducive for MFTL occupancy.

Facing N

Facing S

3347878 N, 11521312 W, Point (8) The eastern boundary. This region is alluvial fan desert scrub with very light alluvial braiding. A few very narrow and shallow washes were examined for sand depth and conistency. None were found to be conducive for MFTL occupancy.

Facing N

Facing S

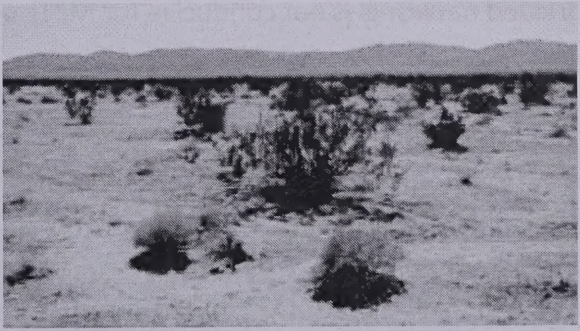
3347871 N, 11521566 W, Point (9) This region is alluvial fan desert scrub with very light braiding. Only a few narrow and shallow washes in this region, which have compacted sands and are not conducive for MFTL occupancy.

Facing N

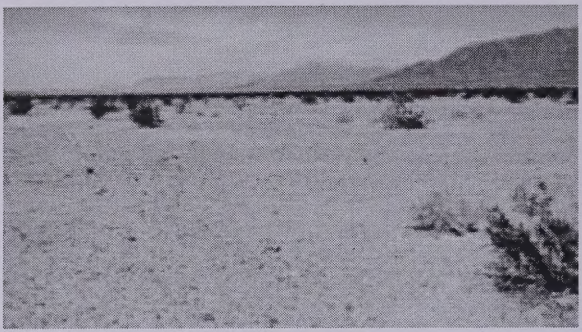
Facing S

3347442 N, 11521570 W, Point (10) This region is alluvial fan desert scrub with very faint surface braiding. Fine sand deposits were extremely shallow. This region is not conducive for MFTL occupancy.

Facing N


Facing S

3347442 N, 11521318 W, Point (11) This region is alluvial fan desert scrub with an exposed base rock substrate. Very light alluvial braiding is visible within this region and cannot support MFTL occupancy.


Facing N

Facing S

3347227 N, 11521318 W, Point (12) Southeast boundary. This region is alluvial fan desert scrub. A few narrow washes in the upper part of this region were examined for sand depth and consistency. None had suitable depth for MFTL occupancy. The southern end of this region crosses a dirt road and runs into an area of agriculture.

Facing N

Facing W

3347228 N, 11522234 W, Point (13) Heading west along the southern boundary this region is alluvial fan desert scrub with many Ironwood trees mixed throughout the alluvial braids and washes. There are isolated areas of fine sand but overall depth and consistency within these braided networks is not conducive for MFTL occupancy.

Facing N

Facing S

3347336 N, 11522497 W, Point (14) Southern boundary. This region is alluvial fan desert scrub with a mix of Ironwood trees throughout. Several sand hummocks appear within this region, but upon examination the sand is too cemented and compacted for MFTL occupancy.

Facing N

Facing S

3347443 N, 115 11522624 W, Point (15) Southern Boundary. This region is alluvial fan desert scrub mixed with Ironwood trees throughout. Several shallow washes were checked for sand grain size and consistency. The sand was too cemented and compacted for MFTL occupancy.

Facing N

Facing S

3347553 N, 11522753 W, Point (16) Heading west along the southern boundary this region is alluvial fan desert scrub mixed with Ironwood trees throughought several braided washes. Isolated pockets of aeolian sand were located but overall depth and consistency are not conducive for MFTL occupancy.

Facing N

Facing S

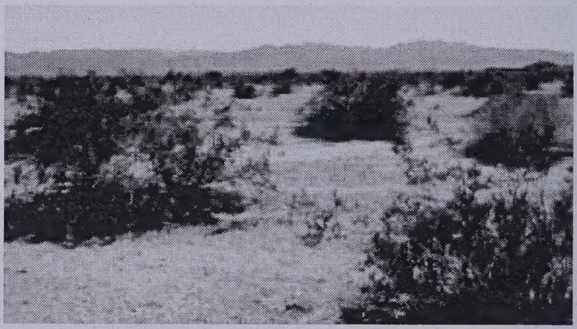
3347663 N, 11523409 W, Point (17) This region is alluvial fan desert scrub with a few scattered Ironwood trees. The few shallow washes in this region are not conducive for MFTL occupancy.

Facing N

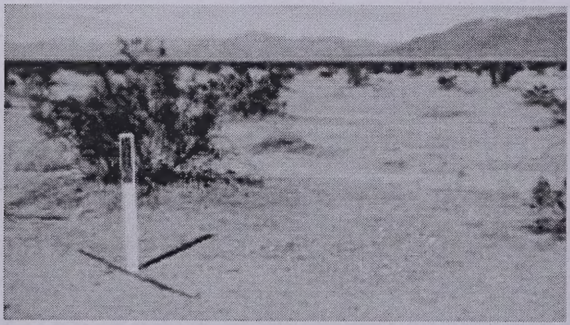
Facing S

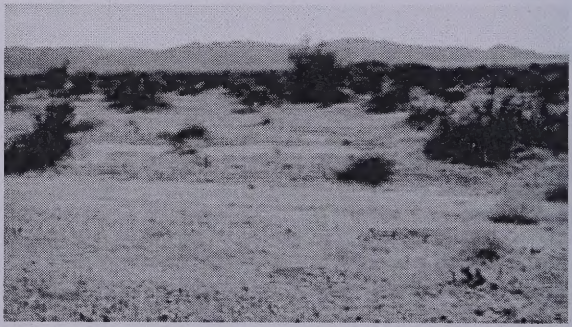
3347770 N, 11523670 W, Point (18) This region is alluvial fan desert scrub with a few Ironwood trees. This area has minimal narrow and shallow washes separated by an exposed base substrate of course gravel. This region is not conducive for MFTL occupancy.

Facing N


Facing S

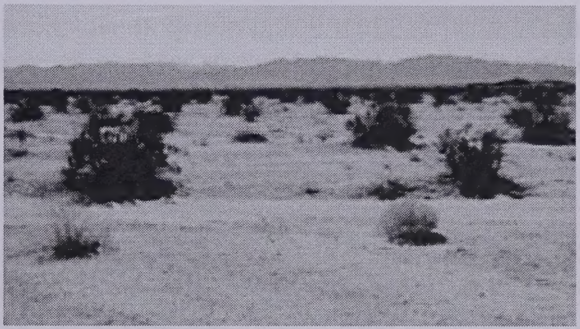
3347877 N, 11523928 W, Point (19) This region is alluvial fan desert scrub with a few Ironwood trees present. The majority of this area has an exposed base substrate of course gravel and cemented sands. The few shallow and narrow washes here are not conducive for MFTL occupancy.


Facing N


Facing S

3347986 N, 11524184 W, Point (20) This region is alluvial fan desert scrub with a few Ironwood trees with an exposed base substrate of coarse gravel. The few small washes in this region were checked for sand depth and consistency. None were conducive to for MFTL occupancy.

Facing N



Facing S

Results

The habitat observed within the proposed Northern project site and its footprint is characterized as alluvial fan desert scrub with Ironwood trees present near its southern boundary. Moderate to light alluvial braiding was documented however the sand within these braids and washes observed was either too cemented and compacted or not fine enough. Sand depth where present throughout these braided networks is very shallow. There were a few isolated areas within these braids that had finer loose sand however not enough to support MFTL occupancy. No MFTL or their sign was observed while temperatures and times were conducive to their activity.

Southern Project Site

The Southern project site is primarily characterized by alluvial fan desert scrub with a mix of Ironwood trees throughout. Several moderate to faint alluvial channels pass through it. The exposed base substrate is largely a mix of cemented sand or gravel and where loose sand was present within the washes, sand depth and consistency was not conducive for MFTL occupancy.

3347659 N, 11525450 W, Point (21) Northwest boundary. This region is alluvial fan desert scrub with an exposed base substrate of coarse gravel and rock. Very minimal alluvial braiding that is not conducive for MFTL occupancy.

Facing N

Facing S

3347660 N, 11524188 W, Point (22) Northern boundary. This region is alluvial fan desert scrub with very light alluvial braids. The with coarse rock and gravel exposed. This area is not conducive for MFTL occupancy.

Facing N

Facing S

3347552 N, 11524185 W, Point (23) Northern boundary. This region is alluvial fan desert scrub with minimal Ironwood trees present. A few shallow washes were checked for sand depth and consistency. None were found conducive for MFTL occupancy.

Facing N

Facing S

3347553 N, 11523670 W, Point (24) Northern boundary. This region is alluvial fan desert scrub with a few Ironwood trees mixed throughout. This area showed light alluvial braiding however none of these braids were conducive for MFTL occupancy.

Facing N

Facing S

3347442 N, 11523417 W, Point (25) This region is alluvial fan desert scrub with Ironwood trees present. Several small washes were present with small pockets of finer sand however none of these had enough sand depth for MFTL occupancy.

Facing N

Facing S

3347337 N, 11523018 W, Point (26) This region is alluvial fan desert scrub with Ironwood trees present. This area appeared to have more fine sand but on close examination the sand was to compacted and cemented to be conducive for MFTL occupancy.

Facing N

Facing S

3347227 N, 11523018 W, Point (27) This region is alluvial fan desert scrub with Ironwood trees present. This area had light alluvial braiding that was dominated by an exposed base substrate of coarse gravel that is not conducive for MFTL occupancy.

Facing N

Facing S

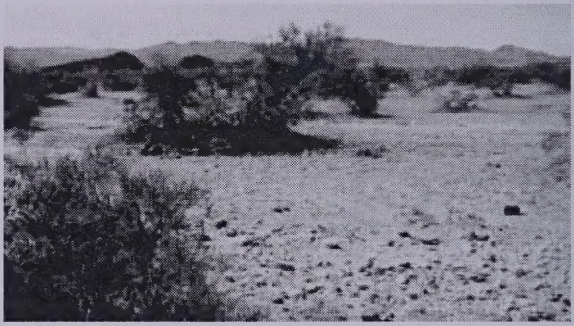
3347227 N, 11523540 W, Point (28) This region is alluvial fan desert scrub with Ironwood trees present. This area had a few shallow and narrow washes that were not conducive for MFTL occupancy.

Facing N

Facing S

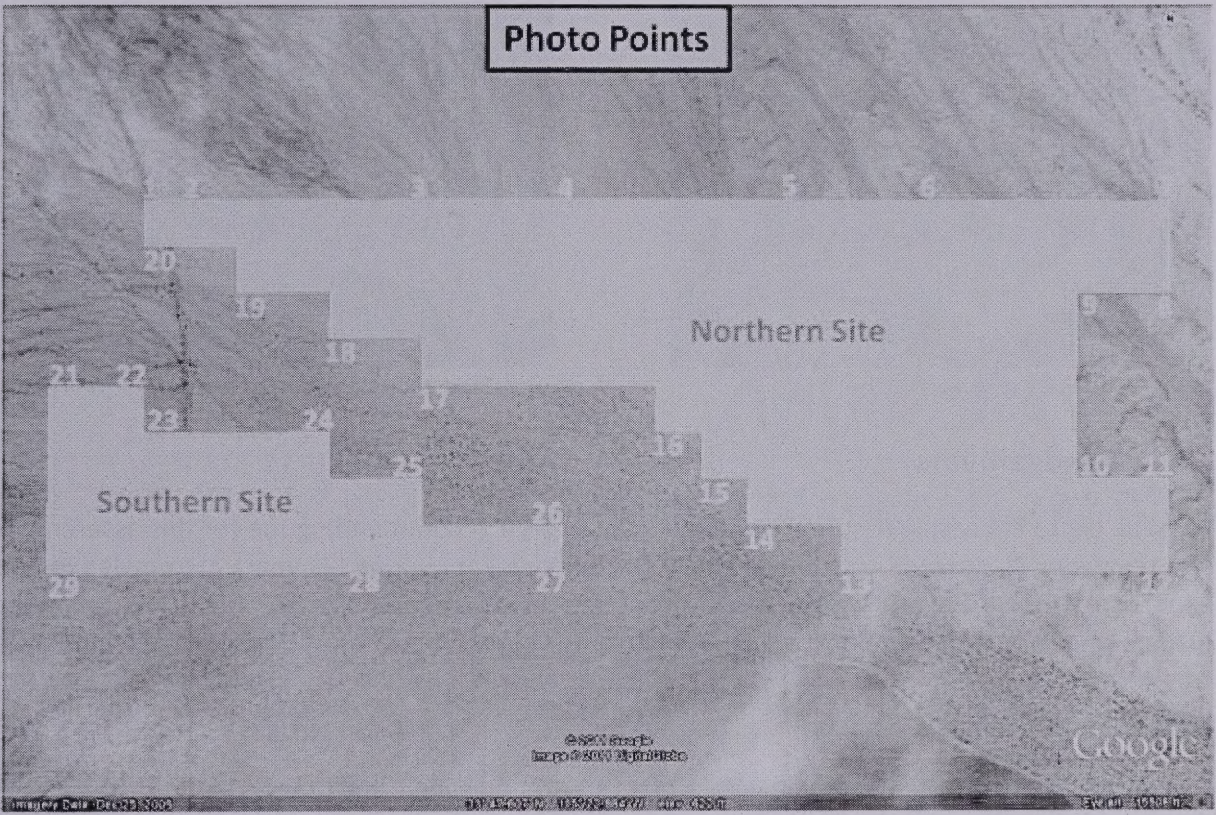
3347224 N, 11524455 W, Point (29) This region is alluvial fan desert scrub with a few Ironwood trees present. This area has an exposed base substrate of coarse gravel and rock. Alluvial braiding is extremely faint and not conducive for MFTL occupancy.

Facing N


Facing S

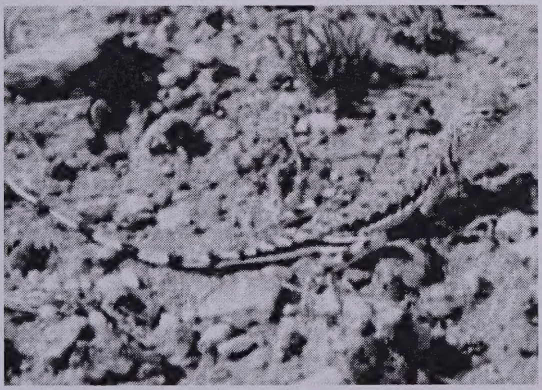
Results

The habitat observed within the southern project site and its footprint is characterized as alluvial fan desert scrub with Ironwood trees present throughout much of its ephemeral makeup. Moderate to light alluvial braiding was documented however the sand within these braids and washes was either too compacted or not fine enough. Sand depth where present throughout these braided networks is very shallow. There were a few isolated areas within these braids that had some finer loose sand however not enough to support MFTL occupancy. No MFTL or their sign was observed while temperatures and times were conducive to their activity.



Lizard species observed at both project sites

Scientific name	Common name
Callisaurus draconoids	Zebra-tail lizard
Cnemidophorus tigris	Western whiptail
Disosaurus dorsalis	Desert Iguana
Uta stansburiana	Side-blotched lizard


Zebra-tail lizard Southern Site

Western whiptail Southern Site

Desert Iguana Northern Site

Side-blotched lizard Northern Site

Acknowledgements

I would like to especially thank Dr. Cameron Barrows for recommending me for this assessment and reviewing it. I would also like to thank Dr. Barrows for sharing his years of knowledge and expertise and hard work within the genus *Uma.* I would also like to thank the following professionals for there support and assistance in this assessment. Scott White and Dustin Ray.

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Appendix C.14

Raven Management Plan

Raven Management Plan
Desert Harvest Solar Project

Prepared for:

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June 2012

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Acronyms and Abbreviations

AC	alternating current
AMEC	AMEC Earth and Environmental
BLM	Bureau of Land Management
BO	Biological Opinion
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CHU	Critical Habitat Unit
DHSP	Desert Harvest Solar Project
DPV	Devers Palo Verde
DSSF	Desert Sunlight Solar Farm
DWMA	Desert Wildlife Management Area
I-10	Interstate 10
ITP	Incidental Take Permit
JTNP	Joshua Tree National Park
MW	megawatt
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
PV	solar photovoltaic
SR-177	State Route 177
USFWS	US Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program
WHMA	Wildlife Habitat Management Area

1.0 Introduction

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Figures 1 and 2). The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2012).

The proposed DHSP is a 150-megawatt (MW) alternating current (AC) solar photovoltaic (PV) renewable energy generating facility and associated generation interconnection (gen-tie) line. The Desert Harvest Solar Farm Draft Environmental Impact Statement (DEIS; BLM 2012) analyzes the proposed solar facility and three alternative configurations. It also analyzes four gen-tie line alternatives (Alternatives B-E; Figure 2). Alternative B is the proposed gen-tie line. It shares towers with the approved Desert Sunlight Solar Farm (DSSF) gen-tie line (BLM 2011). It would be 12 miles long, primarily on BLM land, with approximately one mile of the alignment located on Metropolitan Water District land and Riverside County land (Figure 2).The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and an extension of the applicable permits, approvals and authorizations for the DHSP. Detailed descriptions of the proposed DHSP and alternatives can be found in Chapter Two of the Desert Harvest Solar Farm Draft Environmental Impact Statement (DEIS; BLM 2012).

The project area and surrounding vicinity support desert tortoise (*Gopherus agassizii*) and common raven (*Corvus corax*). Common ravens are the only raven species in the area; the terms “raven” and “common raven” are used interchangeably in this plan. Ravens are predators of juvenile desert tortoise and thrive in areas of human activity. In order to avoid unwanted indirect impacts to the resident desert tortoise population, Mitigation Measure WIL-8 of the DHSP DEIS requires specific measures to control ravens. This Raven Management Plan describes the measures for (1) preventing or minimizing raven subsidies or attractants at the site, (2) monitoring the prevention efforts and raven activity, and (3) adaptive management that enXco will implement during the pre-construction, construction, operations and maintenance (O&M), and decommissioning phases of the project, with the intent of eliminating or minimizing subsidies that attract ravens to the maximum extent practicable.

The purposes of this Common Raven Management Plan are to:

- Identify all potential raven subsidies that are attributable to the proposed Project;
- Describe measures that enXco will implement to minimize or reduce these subsidies;
- Describe a long-term monitoring and reporting program that enXco will implement to track the effectiveness of the Common Raven Management efforts.

1.1 Project Location and Site Description

The DHSP site is located in the upper Chuckwalla Valley, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5’ Victory Pass and East of Victory Pass quadrangles). The proposed solar facility would be on two non-contiguous parcels (Figures 1 and 2). The total solar facility project area is approximately 1,208 acres, consisting of 1051 acres in the larger, northeastern parcel, and 157 acres in the smaller, southwestern one. Construction of the proposed gen-tie line would disturb about 92 acres. The alignment is on the west side of Kaiser Road and parallel to it for about 5 miles, from the solar facility south toward Desert Center; from that point, the alignment continues east across BLM land and then south again, across the I-10 Freeway, to the substation location. This ground disturbance has been analyzed in the Final EIS for the adjacent DSSF project (BLM 2011) and has been authorized in the BLM's Record of Decision and Right-of-Way Grant for that project.

Gen-tie line Alternative C, if selected by BLM, would be on a new alignment parallel and adjacent to the Alternative B alignment, on new poles located 60 feet west of the Alternative B poles. It would result in about 92 acres of new ground disturbance. Construction of gen-tie line Alternatives D or E would disturb slightly fewer acreages (86 and 85 respectively), as described in Chapter 2 of the DEIS. All four alternative gen-tie alignments are shown on Figure 2.

The DHSP solar facility site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. The Desert Sunlight Solar Project, now under construction, is located to the immediate north of the DHSP site, and will occupy 3,761 acres when fully built out (Figure 1). Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford Wildlife Habitat Management Area (WHMA), also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 2). Some of the private lands to the south and west have been developed as residential and agricultural lands. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

The Chuckwalla DWMA and USFWS-designated Chuckwalla Critical Habitat Unit (CHU) for desert tortoise largely overlap one another (see Figure 3.4-1 of the DEIS). Gen-tie line Alternatives B and C are along the boundaries of designated desert tortoise critical habitat and the Chuckwalla DWMA (see Figure 3.4-1 and Section 3.4 of the DEIS). Each alignment would cause ground disturbance to 35.7 acres of the Chuckwalla Critical Habitat Unit, including 1.5 acre that is also within the Chuckwalla DWMA.

Gen-tie line Alternative D would largely follow an existing transmission line southeast across the Chuckwalla Valley (Figure 2). It would affect 14.1 acres of the Chuckwalla Critical Habitat Unit, including 1.7 acre that is also within the Chuckwalla DWMA. It also would affect 6.2 acres of the Palen-Ford WHMA.

Gen-tie line Alternative E would generally follow Metropolitan Water District lands toward the southeast, and then cross public BLM lands south to the Red Bluff Substation location (Figure 2). It would affect 4.3 acres of the Chuckwalla DWMA, including 1.8 acres that are also within the Chuckwalla Critical Habitat Unit. It also would affect 6.2 acres of the Palen-Ford WHMA.

The upper Chuckwalla Valley is surrounded by the Eagle, Coxcomb, and Chuckwalla Mountains, and is underlain by alluvial sediments. The nearest National Park Service land, Joshua Tree National Park (JTNP), surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

1.2 Vegetation and Habitat

Two vegetation types cover the proposed solar facility site and gen-tie line Alternatives B, C, and D: Creosote Bush Scrub and Blue Palo Verde – Ironwood Woodland (Sawyer et al. 2009). There also are small areas of Disturbed/Disused Agricultural Fields on the solar facility site and on gen-tie Alternative D alignment (BLM 2012). Gen-tie line Alternative E traverses sand dune and creosote bush-stabilized dune habitats on part of the alignment. Descriptions and maps of vegetation and the wildlife habitat functions on the project site can be found in Sections 3.3 and 3.4 of the DEIS.

Common ravens and desert tortoises may use all habitats in the project area, though the area is generally modeled as low habitat value for desert tortoise (Nussear et al. 2009). (the solar facility site is modeled as low habitat value; limited disturbance areas on the gen-tie alignment alternatives are modeled as moderate value). During construction, O&M, and decommissioning of the project site, the area will be disturbed by various human activities. Disturbed, ruderal, and non-vegetated areas provide habitat for ravens and other opportunistic wildlife species. Although these areas typically offer little cover or food resources for most wildlife species, ground-dwelling species may frequently cross them or incorporate them into their home-ranges. Common ravens regularly nest, roost, or perch on human structures, including buildings, fences, and the steel lattice towers of transmission lines. From these perches, they often feed opportunistically on road-killed animals or live prey such as reptiles and small mammals in open, disturbed areas.

2.0 Background

2.1 Regulatory Background

This Raven Management Plan conforms to the requirements of Mitigation Measure WIL-8 (quoted in full, below) in the Draft DHSP EIS (BLM 2012) and current US Fish and Wildlife Service (USFWS) guidance for raven management planning (USFWS 2010). At the direction of the BLM, USFWS, and California Department of Fish and Game (CDFG), it may be revised to conform to requirements of (1) relevant provisions of the DHSP Project's Final Environmental Impact Statement, (2) any USFWS Biological Opinion (BO) or CDFG Consistency Determination or Incidental Take Permit (ITP) issued for the DHSP Project, (3) any revisions to relevant mitigation measures that may be adopted in the BLM Record of Decision for the project, and (4) any further direction from the resource agencies. The common raven and other native birds are protected from most take under the federal Migratory Bird Treaty Act and California Fish and Game Code §3503 and §3513. This Plan conforms to these statutes.

MM WIL-8 Raven Monitoring, Management, and Control Plan. The project Owner shall contract a qualified biologist to prepare and implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that shall be consistent with current USFWS raven management guidelines and that meets the approval of the BLM, Riverside County, USFWS, and CDFG. The purpose of the Raven Plan shall be to minimize project-related predator subsidies and prevent any increases in raven numbers or activity during construction, O&M, and decommissioning. The Plan shall address all project components and their potential effects on raven numbers and activity. The threshold for implementation of raven control measures shall be any increases in raven numbers from baseline conditions, as detected by monitoring to be implemented pursuant to the Plan. Regardless of raven monitoring results, the project Owner shall be responsible for all other aspects of raven management described in the Plan, including avoidance and minimization of project-related trash, water sources, or perch/roost sites that could contribute to increased raven numbers, throughout the life of the project, including construction, O&M, and decommissioning. In addition, to offset the cumulative contributions of the project to desert tortoise from increased raven numbers, the project Owner shall contribute to the USFWS Regional Raven Management Program. The project Owner shall do all of the following:

1. **Prepare and Implement a Raven Management Plan** that shall include, but shall not be limited to the following components. The Plan shall be finalized and approved by BLM, Riverside County, USFWS, and CDFG prior to start of construction activities.
    a. Identify all potential project activities, structures, components, and other effects that could provide predator subsidies or attractants, including potential sources of food and water, as well as nest or perch sites. These will include but will not be limited to waste food material, road killed animals, water storage (including evaporation ponds and construction phase storage ponds), potential pooling from leaks, dust control, or waste water, and perch or roost sites on project facilities and infrastructure;
    b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;
    c. Specify a program to monitor raven presence in the project vicinity and detect any increase in numbers or activity;
    d. Specify raven activity thresholds for implementation of control measures;
    e. Describe control practices for ravens to be implemented as needed based on the monitoring results;
    f. Address monitoring and nest removal during construction and for the life of the project; and
    g. Describe reporting schedules and requirements. For the first year of reporting, the project Owner shall provide quarterly reports describing implementation of the Plan, thereafter the reports shall be submitted annually for the life of the project.
2. **Contribute to the USFWS Regional Raven Management Program.** No later than 30 days prior to the start of construction, the project Owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The amount shall be a one-time payment of $105 per acre of long-term or permanent disturbance (totaling $136,500 for a disturbance area of 1,300 acres, to be adjusted according to final project footprint).

2.2 Desert Tortoise

The federally and state listed threatened desert tortoise occurs in the project vicinity. No live desert tortoises or recent sign were observed on the DHSP solar facility site or adjacent areas during the 2010 and 2011 protocol-level field surveys (AMEC 2011a; 2011b). However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments, possibly originating from a desert tortoise, were located on the site. The occurrence of tortoise sign, even where no living tortoises are found during surveys, indicates desert tortoise presence (USFWS 2010). Desert tortoises are found throughout the region and are mobile during their active seasons between May and June, with a secondary activity period from September through October. Tortoises may also be active during periods of mild or rainy weather in summer and winter (Boarman 2002a). Active desert tortoises and sign were located on the adjacent Desert Sunlight Solar Farm (DSSF) site and on the gen-tie alignment proposed for DSSF and DHSP (Ironwood and Woodard 2011).

The DHSP site is within the Colorado Desert Recovery Unit as identified in the Revised Recovery Plan for the Mojave Population of the Desert Tortoise (USFWS 2011a). The USFWS has concluded that too few data are available to support a confident estimate of tortoise densities in the region, but that the ratio of carcasses to live animals found in recent range-wide sampling was low, which may indicate a relatively stable population. The current density estimate for the Colorado Desert Recovery Unit is 5.3 tortoises per square kilometer (USFWS 2011b).

2.3 Common Raven Subsidized Predation

Predation by ravens has become a major problem for some tortoise populations. Common raven populations in the California desert have increased in response to expanding human land uses, because ravens habituate to human activities and are subsidized by human-provided resources including food (e.g., trash, road killed animals), water (irrigation or dust control overspray), and perching, roosting, and nesting sites (transmission towers and other structures). The increased raven population has caused the level of raven predation on juvenile desert tortoises to increase unnaturally (USFWS 2011a).

Raven predation of juvenile tortoise has been evidenced in the Mojave Desert by the remains of tortoise carcasses under raven nests, direct observations, and carcasses with distinctive raven damage (Boarman 1992). For example, there were 185 juvenile carcasses collected near one raven nest in 1987 near Kramer Hills attributed to raven predation (Boarman 2002a).

Ravens may nest in native trees, large shrubs, on rock faces, or on other natural features. Anthropogenic features such as buildings, billboards, signs, utility poles, landscape trees, and other structures have introduced suitable raven nesting sites into areas where nest sites were otherwise very limited (Boarman 2002b). According to Boarman (2003), the majority of raven predation on tortoises can be expected during the spring (April and May) when tortoises are most active and ravens are feeding their young. Ravens feeding chicks spend most of their time foraging within 400 meters (1/4 mile) of their nest (Boarman 2002a). Therefore, the establishment of a new nest can have significant adverse effects on the local juvenile tortoise population. Although a nesting raven pair has the potential to prey on a large number of juvenile tortoises, nesting pairs actively defend their territories against intruding ravens; thereby, limiting the number of ravens within a given area during the breeding season.

2.4 Existing and Potential Raven Subsidies in the Project Area

There are numerous anthropogenic (human-caused) subsidies for ravens and other predators already present in the DHSP vicinity. Thus, tortoises may already be subject to elevated raven predation. Existing subsidies include:

- **Roads.** There are multiple roads and highways in the upper Chuckwalla Valley, including Interstate 10 (I-10) to the south, State Route 177 (SR-177) to the east, and Kaiser Road to the west. Maintained and unmaintained dirt roads also traverse the area surrounding the DHSP site. Road kill and food waste are common along roads, and these food sources subsidize ravens.
- **Lake Tamarisk Golf Club, housing development, and artificial lakes.** Lake Tamarisk Resort is approximately 2 miles south of the solar facility site and adjacent to a portion of Gen-tie Line Alternatives B and C. This member-owned resort has 60 members and 150 mobile home spaces, mobile home rentals, camping spaces, a heated pool, a clubhouse, and a nine-hole public golf course. This community, though small, provides subsidies that would not otherwise be available to ravens. The golf course, lakes, and pool provide water subsidies, and the camping and housing areas probably provide food subsidies such as uncovered trash and pet food. Further, the community is landscaped with trees that provide nest and roost sites.

- **Eagle Mountain community.** The inactive Eagle Mountain Mine was active from 1948 through the 1980s, and there still is a small community near the inactive quarry. The former mining site and the present community continue to provide potential raven subsidies, such as nesting and roosting substrates on quarry rock faces; disused structures; and still active housing, transmission lines, and school. Trash and irrigation water sources could also provide food and water subsidies for ravens.
- **Other local communities.** A few buildings, including a café and a general store are present in the rural community of Desert Center. Much like the nearby community of Lake Tamarisk, Desert Center has a small population that provides subsidies for ravens, including nesting sites on structures and landscaped trees, water tanks that may provide a water source for ravens, and the potential for trash as a food source.
- **Desert Center Airport.** The Desert Center Airport, southwest of the proposed solar facility, was previously owned and operated by Riverside County but is now privately owned. The airport consists of one paved 4,200-foot-long, 50–foot-wide runway, a pilot lounge, storage building, beacon tower, and hangar (BLM 2011). The airport has been redeveloped for use as a private, members-only automotive racetrack, with spaces for recreational vehicles (BLM 2011). Use of the facility could lead to trash or water subsidies, and structures on the site provide potential nest, roost, or perch sites.
- **Desert Sunlight Solar Farm.** The DSSF is now under construction immediately north of the DHSP site. Its potential raven subsidies are similar to those described in Section 3.0 of this Raven Management Plan for the DHSP, and would be mitigated or minimized through similar measures, under mitigation described in the DSSF FEIS (BLM 2011).
- **Existing Utility Infrastructure and Transmission Lines.** There are transmission lines and other utility infrastructure throughout the upper Chuckwalla Valley that provide nesting, roosting, and perching sites for ravens. SCE provides electric power service in the area. An existing SCE 161 kV transmission line crosses Eagle Mountain Road, Kaiser Road, and Desert Center Rice Road from the northwest to the southeast, from about 1 mile north of the Eagle Mountain Substation toward Blythe. The SCE Devers Palo Verde (DPV) transmission line crosses the valley parallel to the I-10 Freeway. The DPV2 transmission line is now under construction parallel to the existing DPV transmission line (raven subsidies from the DPV2 project would be mitigated or minimized according to measures described in that project's Biological Opinion). MWD operates the Eagle Mountain Substation west of the DHSP site, as well as the 230 kV transmission line and 33 kV distribution line along Powerline Road (BLM 2011). The MWD's Colorado River Aqueduct and its components may supply water subsidies to ravens. Other local utility infrastructure such as waste management and telecommunications may also subsidize ravens in the area.

3.0 Potential Subsidies from Desert Harvest Solar Project Features, Construction, and Operation

The following paragraphs describe the potential raven subsidies that could occur during all phases of the Desert Harvest Solar Project. These potential subsidies, along with enXco's mitigation and monitoring measures, are summarized in Table 1.

Table 1. Raven Subsidy Management and Monitoring Summary

Subsidy / Activity	DEIS Measure	Implementation summary	Monitoring	Project phase
Food source: Trash and waste management	WIL-1: Trash and food waste to be placed in self-closing raven-proof trash receptacles.	Section 4.1: enXco will implement as stated, except that waste may be kept within closed vehicles until the end of a shift. Self-closing containers will be available at multiple locations; checked daily and emptied regularly. Food waste temporarily stored on site will be within inaccessible dumpsters or similar containers. All waste will be regularly removed from the site and disposed of in a licensed landfill. All work vehicles will carry garbage bags for collection of any refuse found onsite.	Daily inspection.	Construction O&M Decommissioning
Food source: Surface disturbance (dead or injured animals)	VEG-2 and WIL-1: several measures to minimize injury and mortality to animals during all project phases.	Section 4.1: enXco will implement as stated, by relocating wildlife from harm's way as feasible during ground-disturbing activities, minimizing traffic and vehicle impacts, avoiding pitfalls or other traps to wildlife, reporting injured or dead animals and disposing of road-killed animals. In addition, enXco's Designated Biologist and Biological Monitors will collect and dispose of any animal remains found in any part of the project area throughout the life of the project.	Daily inspection.	Construction O&M Decommissioning
Food source: Road kill (access road)	WIL-1: speed limits, reporting, and inspections to prevent injury or mortality to wildlife.	Section 4.1: enXco will implement as stated, by limiting vehicle speeds,; checking beneath vehicles for wildlife, and reporting or disposing of dead or injured wildlife. In addition, enXco will limit vehicle traffic speeds to 15 mph throughout the solar facility and on gen-tie access roads during all phases of the project; direct all workers to report road-killed wildlife on access roads between I-10 and the solar field. The Designated Biologist or Biological Monitor will collect and dispose of these remains throughout the life of the project.	Daily inspection.	Construction O&M Decommissioning
Ponding water: Vehicle wash station	VEG-9: wash station to prevent weed introductions.	Section 4.1: enXco will implement as stated. The wash station will collect, filter, and re-use wash water to minimize waste or ponding. It will be maintained in proper operating condition throughout its use, and its filters will be changed or rinsed as needed. enXco will ensure that no ponded wash water persists at the wash station site.	Daily inspection.	Construction Decommissioning

Subsidy / Activity	DEIS Measure	Implementation summary	Monitoring	Project phase
Ponding water: Dust abatement	WIL-1: minimize water usage; identify and correct standing water conditions as needed	Section 4.2: enXco will implement as stated.	Daily inspection.	Construction Decommissioning
Ponding water: Evaporation pond	MM WIL-1: requires covering the pond to prevent wildlife access.	Section 4.2: enXco will implement as stated, and maintain the netting or cover material to prevent access.	Daily inspection.	O&M
Ponding water: Leaks	n/a	Section 4.2: enXco will ensure that water tanks are sealed; that trucks are not overfilled; direct all workers to report leaks; leaks will be promptly repaired.	Daily inspection.	Construction O&M Decommissioning
Ponding water: Landscaping / revegetation	VEG-8: Reclamation, revegetation, or restoration of temporarily disturbed areas.	Section 4.2: enXco will implement as stated If irrigation is used at any revegetation or landscaping site, it will be managed to use only the minimum amount of water needed, and no accumulation of standing surface water would be allowed to occur.	Daily inspection.	Construction O&M Decommissioning
Ponding water: Panel washing	n/a	Section 4.2: Wash crews will use only the minimum amount of water needed for panel washing. enXco's Designated Biologist and Biological Monitors will note any standing water resulting from panel washing, for inclusion in regular monitoring reports.	Daily inspection.	O&M
Ponding water: Waste water	n/a	Section 4.2: O&M phase waste water will be disposed of in an on-site septic system. Construction and Decommissioning phase waste water from portable toilets will be trucked off-site for disposal at a licensed facility. No ponding or standing water is expected to result from domestic water use. enXco's Designated Biologist and Biological Monitors will note any standing water around project facilities, for inclusion in regular monitoring reports.	Daily inspection.	Construction O&M Decommissioning
Nest, roost, or perch sites: All facilities	WIL-8: Raven Management Plan.	Sections 4.3, 5.3: Gen-tie design (steel monopoles); remove inactive nests; agency notification of any active raven nests; monitor nests to identify any evidence of predation on desert tortoises.	Weekly breeding season nest inspection.	Construction O&M Decommissioning

3.1 Subsidy: Food Sources

- **Trash and Waste Management (Construction, O&M, Decommissioning)**. Food waste can become a raven subsidy if it is either left on the ground (i.e., litter) or left in accessible open containers. Food waste is a potential problem during all phases of the project, including operations when the work-force would be small.

- **Surface Disturbance (Construction, O&M, Decommissioning).** Grading during site preparation, O&M, and decommissioning phases can injure or kill wildlife, especially small mammals and reptiles, and can unearth burrowing animals. These animals can provide a food subsidy for ravens. Grading and other earthwork will be most important during construction and decommissioning project phases. Grading activities during O&M will be minimal, generally limited to access route maintenance or repair.
- **Road kill on Access Roads (Construction, O&M, Decommissioning).** The project will account for increased traffic along paved access routes between I-10 and the project site. The traffic increase will be greatest during construction and decommissioning phases, when the workforce and equipment and materials deliveries and pickups are greatest. In addition, vehicle traffic on unpaved roads throughout the site may cause road kill during all phases of the project, but especially during construction and decommissioning phases due to higher vehicle traffic volume. Road killed wildlife, including small to medium-sized mammals, reptiles, and (uncommonly) birds, all may serve as raven food subsidies.

3.2 Subsidy: Standing or Ponding Water

Standing water on the project site could subsidize ravens. Several project-related activities could provide water subsidies, including:

- Vehicle Wash Stations (weed prevention measure; Construction, Decommissioning)
- Dust abatement (i.e., road watering; Construction O&M;, Decommissioning)
- Evaporation ponds and temporary storage ponds (Construction, O&M, Decommissioning)
- Leaking pumps, water lines, storage tanks (Construction, O&M, Decommissioning)
- Irrigation for landscaping and revegetation (Construction, O&M, Decommissioning)
- Solar panel washing (O&M)
- Waste water (e.g., food preparation, restrooms, hand washing; Construction, O&M, Decommissioning)

3.3 Subsidy: Nesting, and Roosting, and Perching Sites

Project Facilities and Structures (Construction, O&M, Decommissioning). All project facilities, including gen-tie line towers, solar panels, fences, structures, and electrical infrastructure may provide nesting, roosting, or perching site subsidies throughout the life of the project.

4.0 Subsidy Control Measures

4.1 Subsidy: Food Sources and Attractants

Trash and Waste Management (Construction, O&M, Decommissioning)

Mitigation Measure WIL-1 (item 16) specifies handling of trash and food-related waste. enXco will implement the measure as recommended in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD. enXco will ensure that all workers or visitors to the facility dispose of all food waste, wrappers, and any other trash that could subsidize or attract ravens, in self-closing raven-proof containers. The only exception will be for temporary waste storage kept within closed vehicles until the end of a shift. No food or food waste will be combined with uncovered construction waste or debris, and workers will not be permitted to dispose of food waste or trash in piles or containers of construction debris. At least one self-closing waste container will be located at any break area, any temporary or permanent building, and several containers will be located in parking areas and any other area where workers or visitors congregate. Waste containers will be checked daily and emptied regularly. Any food waste temporarily stored on site will be enclosed within inaccessible dumpsters or similar containers. All waste will be regularly removed from the site and disposed of in a licensed landfill. enXco will also ensure that all work vehicles will carry strong garbage bags for collection of any refuse found onsite. At the end of each day, staff will place bagged refuse into the large containers (above).

Surface Disturbance (Construction, O&M, Decommissioning)

Mitigation Measures VEG-2 and WIL-1 include several measures to minimize injury and mortality to animals during all project phases. enXco will implement these recommendations as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD. These include relocating wildlife from harm's way as feasible during ground-disturbing activities (MM VEG-2), minimizing traffic and vehicle impacts (MM WIL-1, items 3 and 10), avoiding pitfalls or other traps to wildlife (MM WIL-1, item 11), and reporting injured or dead animals and disposing of road-killed animals (MM WIL-1 items 13 and 14). In addition, enXco's Designated Biologist and Biological Monitors will be directed to collect and dispose of any animal remains found in any part of the project area throughout the life of the project, following the procedure described in Mitigation Measure WIL-1, item 14.

Road kill on Access Roads (Construction, O&M, Decommissioning)

Mitigation measure WIL-1 recommends limiting vehicle speeds to 15 mph on any project-related roads where desert tortoise exclusion surveys have not been completed (item 3); checking beneath vehicles for wildlife (item 10), and reporting or disposing of dead or injured wildlife (items 13 and 14). enXco will implement these recommendations as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD. In addition, enXco will limit vehicle traffic speeds to 15 mph throughout the solar facility and on gen-tie access roads during all phases of the project. enXco will direct all workers to report any road-killed wildlife on access roads between I-10 and the solar field. The Designated Biologist or Biological Monitor will handle these remains following the procedure described in Mitigation Measure WIL-1, item 14.

4.2 Subsidy: Ponding Water

Vehicle Wash Stations (Construction, Decommissioning)

Mitigation Measure VEG-9 requires vehicle washing to prevent introduction in invasive weeds to the project site. enXco will implement the recommendation as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD. The wash station will collect, filter, and re-use wash water to minimize waste or ponding. It will be maintained in proper operating condition throughout its use, and its filters will be changed or rinsed as needed. enXco will ensure that no ponded wash water persists at the wash station site.

Dust Abatement (Construction, Decommissioning)

Mitigation Measure WIL-1 (item 12) recommends minimizing water usage for dust control, and recommends monitoring to identify and correct standing water conditions if needed. enXco will implement the recommendation as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD.

Evaporation Ponds and Temporary Storage Ponds (*Construction, O&M, Decommissioning*)

Mitigation Measure MM WIL-1 (item 20) requires covering the evaporation pond to prevent wildlife from accessing it. enXco will implement the recommendation as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD.

Leaking pumps, water lines, storage tanks (Construction, O&M, Decommissioning)

enXco will ensure that water tanks are sealed and free of leaks at all times, and that trucks are not overfilled. enXco will direct all workers to report any water leaks. Any leak causing standing surface water that could be available to ravens leaks will be promptly repaired. enXco's Designated Biologist and Biological Monitors will be directed to note any leaking or standing water, for inclusion in regular monitoring reports.

Landscaping and Revegetation (Construction, O&M, Decommissioning)

Mitigation Measure VEG-8 requires a Vegetation Resources Management Plan, to include reclamation, revegetation, or restoration of temporarily disturbed areas. enXco will implement the recommendation as stated in the DEIS (BLM 2012) and updated if appropriate, pending any changes in the FEIS or ROD. If irrigation is used at any revegetation or landscaping site, it will be managed to use only the minimum amount of water needed, and no accumulation of standing surface water would be allowed to occur.

Solar Panel Washing (O&M)

Panel washing will take place overnight. Maintenance crews will use only the minimum amount of water needed for panel washing. The wash water will be allowed to run off the panels to the ground below where it is expected to percolate into the soil. No ponding or standing water is expected to result from panel washing. enXco's Designated Biologist and Biological Monitors will be directed to note any standing water resulting from panel washing, for inclusion in regular monitoring reports.

Waste water (Construction, O&M, Decommissioning)

Waste water from food preparation, rest rooms, hand washing, or other sources during the O&M phase would be treated and disposed of on-site, in a septic system to be constructed and licensed according to requirements of the Riverside County Health District. Waste water from portable toilets during construction and decommissioning project phases will be trucked off-site for disposal at a licensed treatment facility. No ponding or standing water is expected to result from domestic water use. enXco's Designated Biologist and Biological Monitors will be directed to note any standing water around project facilities, for inclusion in regular monitoring reports.

4.3 Subsidy: Nesting, Roosting, and Perching Sites

Project facilities and structures (*Construction, O&M, Decommissioning*)

enXco will minimize the nest site subsidy by using steel monopoles (rather than steel lattice) for the gen-tie line, removing inactive raven nests or other suitable stick nests, and by minimizing availability of food and water subsidies throughout the project facility. No nesting platforms or similar structures will be installed on the structures. However, ravens cannot be fully prevented from nesting, roosting, or perching on project facilities. In compliance with the federal Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and 3513, enXco will not remove active bird nests at any time. Instead, the CDFG and USFWS will be notified of any active raven nests on project facilities, and the Project Biologist or Biological Monitors will monitor the nests to identify any evidence of predation on desert tortoises (see Section 5.3, below).

5.0 Monitoring

5.1 Designated Biologist and Biological Monitors

enXco will appoint a Designated Biologist who will be responsible for implementing and managing the monitoring plan described below, and providing monitoring reports to enXco, CDFG, BLM, USFWS, and Riverside County. Many of the monitoring tasks may be completed by Biological Monitors, overseen by the Designated Biologist.

5.2 Monitoring Tasks: Food and Water Subsidies

The Designated Biologist or Biological Monitor will conduct daily monitoring inspections of project activities and potential subsidies (e.g., trash containers, water lines) throughout the solar facility site, during construction, O&M, and decommissioning phases of the project. In addition, they will inspect any project activities or potential raven subsidies on the gen-tie alignment during the construction and decommissioning phases, and during any O&M activities along the gen-tie alignment. Inspections may be skipped on holidays or weekends only if no project-related activities are scheduled; otherwise inspections will be made daily. The Designated Biologist or Biological Monitor will complete a daily monitoring report form, to confirm inspection of items listed below. A draft report form is provided (Attachment 1). Daily inspections will include the following:

- Trash receptacles (locking lids; any exposed or overflowing trash);
- Food waste or food-related trash on ground or open vehicle (any time or location);
- Trash storage area (dumpsters);
- Vehicle speed (vehicle description, license number or other ID, time and location);
- Standing water (any time or location, including tanks, pumps, pipes, irrigation sites, trucks, road watering, and panel washing areas);
- Evaporation pond netting and wildlife access prevention;
- Dead or injured animal (any time or location); and
- Raven observation (record time, date, location, number of ravens, and activity for each raven observation)

In addition to daily inspections the Designated Biologist or Biological Monitor will be responsible for the following activities to minimize food subsidies for ravens:

- During all soil disturbing activities, attempt to relocate animals from the area prior to disturbance, and remove any dead or injured wildlife from the work area, according to requirements of Mitigation Measures VEG-1 and WIL-1;
- Handle road killed or injured wildlife according to Mitigation Measure WIL-1.

Daily monitoring logs will be submitted to the Site Supervisor each day upon completion of monitoring tasks. The log will include fields to confirm inspection of each facility. For any facility or condition in need of review or repair, the log will include fields to record the location, date and time of inspection, and any specific problem. The Designated Biologist or Biological Monitor will also highlight any condition or facility in need of correction for the Site Supervisor's attention. Completed daily logs will be available to the Designated Biologist and Biological Monitors during follow-up monitoring visits. Follow-up daily inspections will document correction of the problem. All daily monitoring logs will be included as electronic attachments to the annual monitoring reports.

Success criteria for all these daily tasks will be that each problem identified/reported will be corrected or resolved within 24 hr. or one full working day after the daily report is filed.

5.3 Monitoring Tasks: Raven Nesting or Nest Availability

Weekly monitoring. The Designated Biologist, Biological Monitor, or a qualified contractor shall inspect the gen-tie line and solar facility weekly during the raven nesting season (March through early July) to identify any courtship or nesting behavior, initiation of any stick nest construction (whether by raptors or ravens) on project facilities, and the progress and success of any stick nests on the structures. Other potential nesting sites within 0.25 mile of any project facility will also be monitored (including parallel transmission or distribution lines, the existing SCE transmission line crossing the southern portion of the solar facility site; and ornamental trees at Lake Tamarisk and Desert Center, near the gen-tie alignment).

If ravens or raptors nest on any project facility or other site within 0.25 mile of the project facilities, the Designated Biologist, Biological Monitor, or a qualified contractor will document nesting progress, including success or failure, and inspect for any evidence of predation on desert tortoises, during each weekly monitoring visit throughout the nesting season. All nest monitoring data will be summarized in annual reports and the data itself will be provided in electronic format as an electronic appendix.

The Designated Biologist will report any active raven nest to enXco, the USFWS, CDFG, and BLM. The Designated Biologist will also report any evidence of raven predation on desert tortoises to the agencies.

Nest removal. After nesting activity has ceased at any stick nest on DHSP facilities suitable for future use by common ravens, the Designated Biologist will report the nest site to enXco maintenance staff, who will be responsible for removing it. Nest removal will be confirmed by the designated biologist and reported in the annual monitoring report.

Baseline data and future raven nesting activity. During the first year of project construction, survey data on the nearby nest sites will serve as baseline data for comparison of raven nesting activity during project construction, O&M, and decommissioning. Evaluation of possible project-related increase in local raven nesting activity will be made by comparison with this baseline, as well as annual weather patterns, changes in local land use and human activity, and other potential influences on raven behavior, as appropriate.

5.4 Reporting

enXco will submit monitoring reports to the CDFG, BLM, and USFWS no later than December 31 of each year. The annual monitoring reports will document raven management measures that have been implemented as well as track the effectiveness of the measures through the results of raven abundance. The raven management practices, such as employee education, trash containment, and reporting raven nests, will be implemented for the life of the solar facility.

The annual report will include:

- Summary of raven observations and behavior (from daily monitoring report forms);
- Summary of annual nesting season monitoring, including locations and species for all observed stick nests on DHSP facilities and within 0.25 mile;
- Documented raven nesting, roosting, and perching locations;
- Number and locations of any stick nests removed from DHSP facilities; and
- Recommendations by the Designated Biologist for improving raven management.

Observations of active raven nests and evidence of raven predation on juvenile tortoises will be reported to the designated contacts at BLM, CDFG, and USFWS by an electronic mail message within 2 days of the observation.

All monitoring data will be provided electronically. The report itself will be brief, simply reviewing the monitoring requirements; describing any deviations (no monitoring on a certain date due to illness, etc.) and summarizing any problems and how they were corrected. For nest monitoring, reports will list dates of field work and map locations of all nests found; for each nest, name the species, the active dates, the eventual result of the nest, such as abandonment or fledged young.

6.0 Adaptive Management

Adaptive management measures may be necessary if the DHSP facilities and related activities provide significant unavoidable subsidies to ravens, or if a future increase in local raven nesting activity is attributable to the DHSP. Unavoidable subsidies will include nesting, roosting, or perching sites on project facilities, and may also include water at storage ponds or pump locations, if prevention of standing water proves infeasible. If raven monitoring data indicate a clear increase in local raven nesting activity attributed to the DHSP, then enXco and its Designated Biologist will confer with the USFWS, CDDFG, and BLM to develop and implement further raven control measures. Adaptive management measures may include additional worker education, more stringent restrictions on water use or trash disposal, installation of nest-prevention or roost-prevention devices on project facilities (depending on availability of effective devices), or specific measures to "haze" ravens from project facilities or subsidies.

7.0 Education

A Worker Environmental Awareness Program (WEAP) is now in preparation. The WEAP will include the following specific instructions for on-site workers to prevent or minimize raven subsidies:

- Review of raven biology, including desert tortoise predation and dependence on human subsidies;
- Specific responsibilities and consequences for all workers;
- Trash and food waste disposal and control;
- Reporting road killed wildlife, water leaks, or other subsidies

8.0 References

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Attachment 1: Desert Harvest Solar Project - Common Raven Management Plan
Daily Monitoring Form

General Location: ______________________

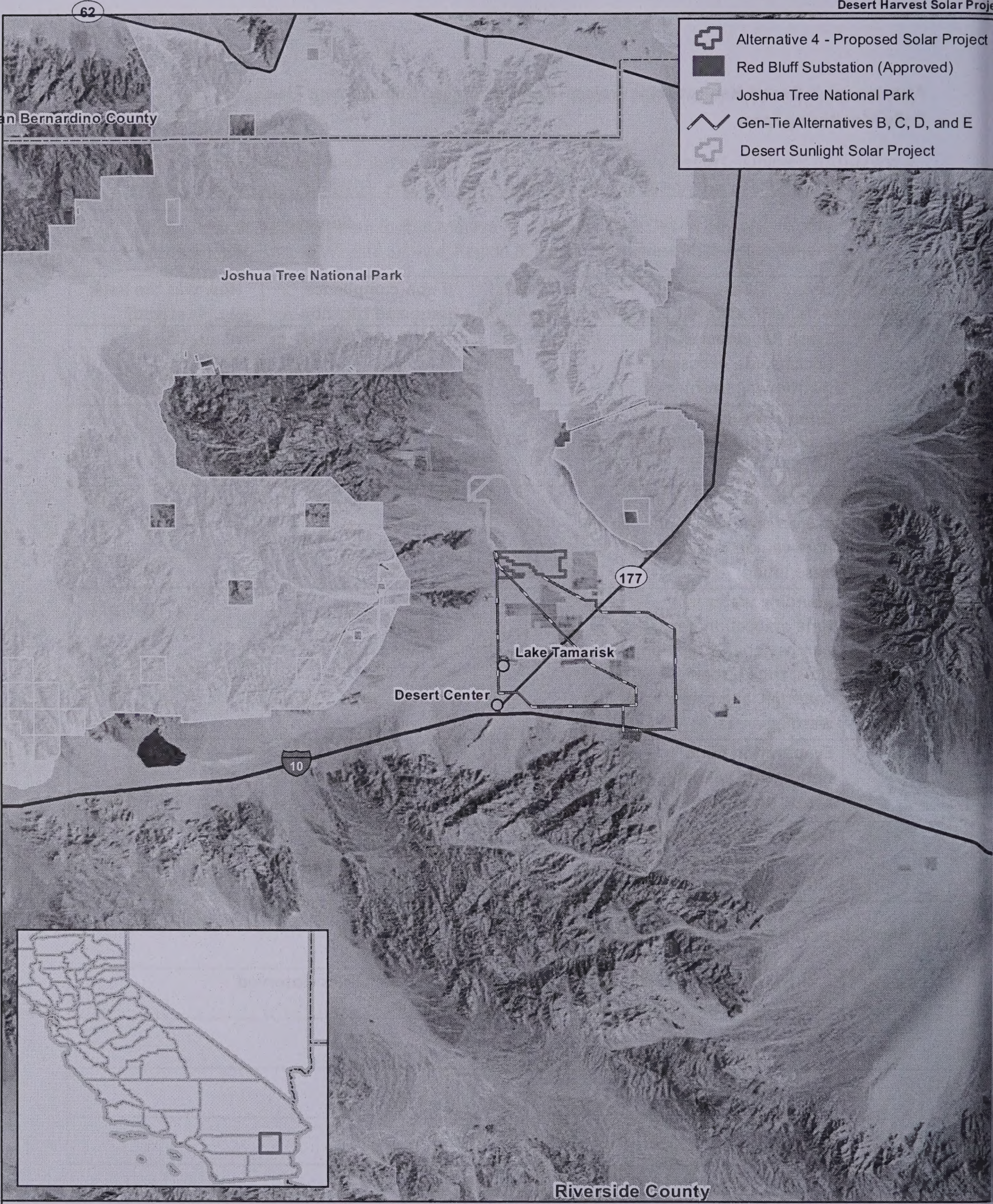
Date: ______________________

Surveyor: ______________________

Checked? Y/N	Task	Compliance? Y/N	If non-compliance, Issue and Location	How was the issue Resolved?
	Trash Receptacles (locking lids, exposed or overflowing trash)			
	Dumpsters (locking lids, exposed or overflowing trash)			
	Vehicle speed (limit on project roads: 15 mph; note vehicle number/ description)			
	Standing water (any time or location: tanks, pumps, pipes, irrigation sites, trucks, road watering, and panel washing areas)			
	Evaporation pond netting and wildlife access prevention			
	Dead or injured animals (list species; any time or location)			

Raven Observation (continue on back)

Date and Time	Location, GPS Coordinates	Number observed	Activities Observed


62
Alternative 4 - Proposed Solar Project
Red Bluff Substation (Approved)
Joshua Tree National Park
Gen-Tie Alternatives B, C, D, and E
Desert Sunlight Solar Project
an Bernardino County
Joshua Tree National Park
177
Lake Tamarisk
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Aspen Environmental Group

Figure 1

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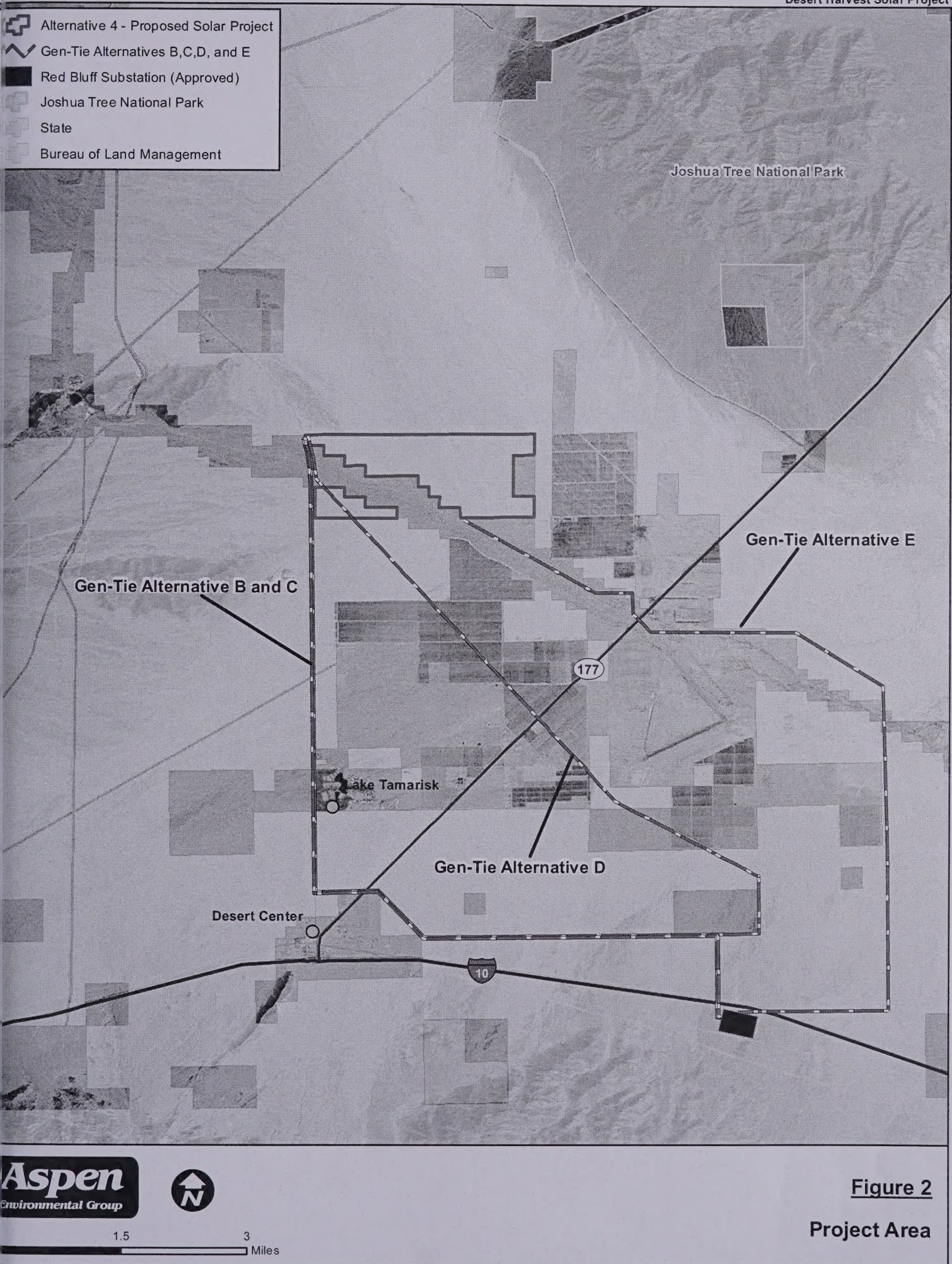
Alternative 4 - Proposed Solar Project
Gen-Tie Alternatives B,C,D, and E
Red Bluff Substation (Approved)
Joshua Tree National Park
State
Bureau of Land Management
Joshua Tree National Park
Gen-Tie Alternative E
Gen-Tie Alternative B and C
177
Lake Tamarisk
Gen-Tie Alternative D
Desert Center
10
Aspen
Environmental Group
N
1.5
3
Miles

Figure 2

Project Area

Appendix C.15

Worker Environmental Awareness Plan

Draft Worker Environmental Awareness Program
Desert Harvest Solar Project

Prepared for:

enXco
5000 Executive Parkway, Suite 140
San Ramon, CA 94583

Prepared by:

Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

July 2012

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enXco's Commitment

enXco is committed to protecting all sensitive biological resources during construction, operation, and closure/decommissioning of the Desert Harvest Solar Project (DSHP). This Worker Environmental Awareness Program (WEAP) is required by the Applicant Proposed Measure AM-BIO-4 and Mitigation Measure VEG-3.

The DHSP is a 150 megawatt (MW) solar photovoltaic power plant located on about 1,200 acres east of Kaiser Road, about 5 miles north of Desert Center in Riverside County. This WEAP handbook includes an overview of the sensitive biological resources that may be encountered during construction and operation of the DHSP and includes guidelines for protecting these resources. The project has authorized specialists and monitors to support the monitoring effort. The Designated Biologist and onsite Biological Monitors are the onsite contact for all issues pertaining to biological resources. Please ask before you act!

This WEAP will be administered to all on-site personnel and will be implemented during site pre-construction, construction, operation, and closure/decommissioning. Please sign the training acknowledgement form (see Attachment 1) verifying that you received this training and shall abide by the guidelines provided. The training is valid for one year.

1. Contact Personnel

[To be included]

2. Environmental Laws, Regulations, and Penalties

The biological resources found on the DSHP site are protected by Applicant Proposed Measures, Mitigation Measures, and additional measures required by permits for the project. Many of the resources found in the project area are also protected by state and federal laws including but not limited to the following:

- **Federal Endangered Species Act**: Provides protection for federally-listed threatened and endangered plant and animal species. It also prohibits the destruction of habitat critical to their recovery.
- **California Endangered Species Act**: Similar to the federal act, it prohibits the take of state-listed endangered and threatened wildlife. Take is defined as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."
- **Migratory Bird Treaty Act**: Prohibits the take of migratory birds. This includes eggs, nests, and feathers of any bird, which are fully protected. Raptors such as eagles, hawks, and owls are a special subset of birds covered under federal and state migratory bird laws. Raptors and their nests are protected.
- **Bald and Golden Eagle Protection Act**: Protects bald and golden eagles from any harassment that would interfere with its normal breeding, feeding, or sheltering behavior. Therefore, the requirements for guarding against impacts to eagles generally are more stringent than those required by the Migratory Bird Treaty Act alone.
- **California Fish and Game Code**: Prohibits take of protected plants and animals in California; protects birds and birds' nests (similar to federal Migratory Bird Treaty Act); protects streambeds, including dry desert washes.
- **Protected Furbearers**: Protects all "fur-bearing" species, regardless of their federal or state status. This especially prohibits the take of desert kit fox (as above, defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill").
- **Noxious Weed Act**: Provides for the control and management of noxious weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.

The following agencies have regulatory authority in the area and will monitor construction activities. They could be on site at any time:

- Bureau of Land Management
- U.S. Fish and Wildlife Service
- California Department of Fish and Game
- County Officials

Stay out of exclusion zones. They protect sensitive habitats. Violation of state and/or federal environmental laws can result in penalties including fines up to $100,000 and/or up to one year in jail. Violations can involve corporate and individual penalties. Violations can result in stop work orders and construction delays.

3. Biological Environmental Impacts and Mitigation Measures

A variety of measures have been designed for the project to reduce impacts to vegetation and wildlife. One of the primary tools used to protect sensitive plants and animals is flagging. Prior to the start of construction, work areas (including staging areas, access roads, and sites for temporary placement of construction materials and spoils) will be delineated with highly visible and weather resistant fencing/flagging (e.g., orange construction fencing or staking) to clearly identify the limits of work. Fencing/staking will remain in place for the duration of construction. All disturbances, vehicles, and equipment will be confined to the fenced/flagged areas.

In addition to respecting the flagged areas, each worker is responsible for making sure she or he abides by the mitigation measures for the project including the following:

- Ensure open trenches have escape ramps for small animals including desert tortoise, or are covered completely.
- Reduce the extent of temporary construction work areas and minimize impacts to native vegetation and habitat.
- Best Management Practices will be used during construction at or near drainages. Water containing mud, silt, or pollutants will not enter drainages or be put in locations with high storm flows.
- Raw cement/concrete, asphalt, paint, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources will be prevented from contaminating the soil and/or entering drainages.
- No trash will be deposited within 150 feet of the high water mark of any drainage. All trash and food-related waste shall be placed in self-closing containers and removed regularly from the site.
- Do not feed wildlife or bring pets to the project site.
- Do not harass or harm any wildlife on site including snakes, reptiles, or other wildlife.
- Cleanup all spills immediately. Notify your supervisor immediately of any spills. Supervisors will be responsible for notifying the BLM, CDFG, or Riverside County as required.
- The Designated Biologist and Biological Monitors will conduct clearance surveys prior to ground disturbance including clearly marking sensitive biological resource areas, and they will be present during all ground-disturbing activities. Construction work areas will be marked with highly visible and weather resistant fencing/flagging (e.g., orange construction fencing or staking) to clearly identify the limits of work to protect sensitive habitats. Be aware of your limits.
- Inspect active construction and O&M activity areas where animals may become trapped prior to construction commencing each day.
- Erosion control and revegetation will be implemented for the project according to approved plans.
- At the end of each work day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity.
- Report any injured or dead wildlife to the designated biologist and/or biological monitors immediately.
- Abide by the fire prevention plan and make sure local fire agencies have 24-hour access to the project site.
- Monitor for fire risks and report fires and fire risks immediately.

4. Designated Biologists and Biological Monitors

The DHSP Designated Biologists are responsible for implementing the project's Biological Resources mitigation measures and providing direct assistance to avoid impacts to natural resources. **The Designated Biologists have the authority to halt work if project activities do not comply with mitigation measures incorporated into the Record of Decision or applicable permits for the project involving biological resources.**

4.1 Duties of the Designated Biologist

The Designated Biologist has the following responsibilities and serves as a point of contact for all construction workers while in the field.

- Notifies the BLM's Authorized Officer, Riverside County, and the Resource Agencies at least 14 calendar days before initiation of ground-disturbing activities. Immediately notifies the project Owner, BLM's Authorized Officer, Riverside County, and the Resource Agencies in writing of any non-compliance with any of the biological mitigation measures or permit conditions. Notifies these agencies of dead or injured special-status species within 24 hours of discovery.
- Conducts continuous compliance inspections throughout the initial site preparation activities, including construction of tortoise-exclusion fencing; pre-construction clearance surveys; and initial clearing, grubbing, and grading. Provides verbal and/or written updates to BLM, Riverside County, and Resource Agencies as required by mitigation measures.
- Conducts monthly compliance inspections throughout the construction and decommissioning phases of the project, and provides weekly verbal or written updates to BLM, Riverside County, and, for any information pertinent to state or federal permits, to the Resource Agencies. Prepares and submits monthly compliance reports as required.
- Conducts quarterly compliance inspections during operations of the project; conducts weed monitoring and control; prepares and submits quarterly compliance reports and other reports as required under all adopted mitigation measures.
- Supervises, conducts, and coordinates mitigation, monitoring, and other biological resources compliance requirements, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat; and appoints a Biological Monitor as temporary contact at any time the Designated Biologist is unavailable.
- Responds directly to inquiries of the BLM, Riverside County, the Resource Agencies, NPS, or any other agencies regarding biological resource issues.
- Trains and supervises the Biological Monitors as appropriate, and ensures their familiarity with the Worker Environmental Awareness Program training, mitigation measures, conditions required by biological permits and agreements, and current USFWS guidelines on desert tortoise surveys and handling procedures.
- Approves fueling and servicing areas and is notified of any spills of hazardous materials.
- Reports all special-status species observations to the CNDDB and includes copies of these reports in monthly or quarterly monitoring reports.

The Designated Biologist and Biological Monitors will be on the site during mobilization activities, construction-related ground disturbance, grading, boring, or trenching during all phases of the project and will clear areas before any and all surface disturbance begins. **The Designated Biologist has the authority to stop work if any violation of mitigation measures occurs in the project area. The Biological Monitors have the authority to order any reasonable measure to avoid take of a listed species.** Mitigation measures for the project are described in the Record of Decision for the project and in the Mitigation Monitoring and Reporting Plan. A copy of all mitigation measures for the project will be keep onsite at [location to be determined].

4.2 Duties of the Biological Monitors

The duties of the Biological Monitors include, but are not limited to, the following activities:

- Conduct clearance surveys and monitoring of mobilization activities, construction-related ground disturbance, grading, boring, or trenching during all phases of the project.
- Clearly mark sensitive biological resource areas, as appropriate, during construction, O&M, and decommissioning, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions.
- Conduct pre-construction nest surveys for nesting birds prior to construction activities that will occur during the breeding period.
- Verify that work areas are delineated with highly visible and weather resistant fencing/flagging (e.g., orange construction fencing or staking) to clearly identify the limits of work prior to ground-disturbing activities.
- Inspect active construction or O&M activity areas where animals may have become trapped before beginning construction each day. At the end of each work day, inspect whether covers to prevent entrapment or ramps to allow escape have been used. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way and relocate them if necessary.
- Present WEAP training to all project personnel and provide documentation to the BLM, Riverside County, and Resource Agencies (as applicable).

5. Your Responsibility

5.1 Wildlife Observation Form

It is the responsibility of all personnel to complete a wildlife observation form (see Attachment 2) whenever they encounter an injured animal or any special status species or their sign (e.g., nest, burrow, or other sign) that could be disturbed by any project activity. These forms will be available in the Environmental Compliance Manager's trailer and the safety training trailer. All wildlife sightings must be reported to the Biological Monitor. The monitor will assist you if you have any questions about completing these forms.

5.2 Wildlife Practices

You are responsible for making sure you abide by the following practices during construction, operation, and closure/decommissioning of the project:

- All personnel, equipment, and vehicles are to remain inside fenced or staked areas.
- Do not handle wildlife.
- Do not feed or disturb wildlife.

- If wildlife is accidentally harmed, immediately notify the Designated Biologist or a Biological Monitor.
- Notify the Designated Biologists or Biological Monitors if you observe any of the following:
  - Any injured, wounded, or dead animal.
  - Any animal that could be disturbed by any work activity (in harm's way and needs moving).
  - Any breach or tear in tortoise fencing.
  - Any breach or tear in fencing surrounding protected rare plant areas.
  - A desert tortoise, snake, Mojave fringe-toed lizard, burrowing owl, nesting birds, or raptors foraging or nesting onsite.
  - Anyone not following the procedures set forth in this manual.

5.3 Vegetation Practices

- All personnel, equipment, and vehicles are to remain inside fenced or staked areas.
- Do not operate vehicles or equipment in ponded or flowing water except as permitted
- Minimize vegetation clearing; when feasible implement drive and crush instead of grading
- Practice weed control methods; use weed-free straw or hay bales; control weeds in areas where dust control, irrigation, and solar panel washing occurs.

5.4 General Work Practices

- Use only approved access roads.
- Inspect potential pitfalls (trenches, bores, excavations, etc.) for wildlife each morning before starting work.
- Inspect all uncapped pipes and/or culverts for the presence of wildlife. If encountered the wildlife shall be allowed to escape unimpeded.
- Do not litter. All general trash, food-related trash items (e.g., wrappers, cans, bottles, food scraps, cigarettes, etc.) and other human-generated debris should be stored in animal-proof containers and/or removed from the site each day.
- No pets are ever allowed on the project site or in the project area.
- Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.
- No fires allowed. Monitor for fires and immediately report any fire to supervisors.
- Smoke only in posted and designated areas. Cigarette butts must be disposed of in the receptacles provided.
- Clean up and report all hazardous material spills immediately. Keep spill clean-up materials and equipment onsite and know their locations. Know the members of the team who are trained in spill response procedures.
- Use silt fences along neighboring properties and main drainages for erosion control during storm events.
- Report wildlife observations to the Designated Biologists or Biological Monitors.

- Report trapped, injured, or dead wildlife to the Designated Biologists or Biological Monitors immediately and record the specifics on a Wildlife Observation Form (see Attachment 2). Forms are available in the [to be designated].
- Report any road killed animals immediately to the Designated Biologist and Biological Monitors.
- Maintain vehicles and equipment in proper working conditions. Use designated areas approved by the Designated Biologist for fueling and servicing.
- Abide by all speed limits. The speed limit on unpaved roads is 15 mph.

Remember, always ask before you act.

6. Sensitive Biological Resources

6.1 Habitat Types

There are two primary habitat types within the project site and nearby vicinity. There are small areas within the project site where natural vegetation has been removed or disturbed for roads and other land uses.

Creosote Bush Scrub

Creosote Bush Scrub (Sonoran Desert Scrub) is characterized by low diversity of shrub species with relatively wide spacing of shrubs, usually with bare ground between shrubs. The dominant species in this vegetation is creosote bush but also includes desert pavement and other species. It provides habitat for many types of animals including burrowing species such as kangaroo rates and pocket mice as well as many types of reptiles. Common birds observed within this vegetation community include the black-throated sparrow, quail, common raven, red-tailed hawk and turkey vulture.

Blue Palo Verde–Ironwood Woodland

Blue Palo Verde–Ironwood Woodland (Desert Dry Wash Woodland) occurs throughout the project study area, primarily in dry washes. This vegetation type is characterized by the presence of desert ironwood and blue palo verde. Vegetation in desert washes is generally taller, up to 9 meters (30 feet) in height, and denser than that of surrounding desert habitats. This vegetation provides greater food, nesting, and cover, and wildlife diversity is generally greater than in the surrounding desert.

6.2 Special Status Wildlife

The DHSP site and vicinity include features that provide habitat for sensitive plants and wildlife. Of particular concern is the desert tortoise.

Desert Tortoise

Photo Credit: USFWS, 2010

The DHSP site and vicinity is habitat for the federally and state threatened desert tortoise. Desert tortoises are found throughout the region and are mobile during their active seasons between May and June, with a secondary activity period from September through October. Any construction activity involving equipment or vehicle movement anywhere in the project site or vicinity is a potential threat to the desert tortoise. All construction activities, project vehicles, and equipment must stay within the fenced construction areas that biologists have identified and cleared of desert tortoises. All work areas are to be confined to the smallest practical area, considering topography, placement of facilities, public health and safety, and other limiting factors. Use previously disturbed areas to the extent feasible.

What You Should Know About the Desert Tortoise

The desert tortoise is the largest reptile in the southwestern United States. It is distinguished by a domed shell. Shell color is brownish, with yellow to tan centers. Adults can be over one foot long. Juveniles and hatchlings are smaller but resemble adults. Hatchlings can be as small as 1½ inches. Tortoise can live to be 50 to 100 years old and take 15 to 20 years to reach sexual maturity. Although tortoises have existed for millions of years, the number of these animals is declining. The reasons for the drop in numbers includes loss of habitat through urban development, disease, roads, introduction of exotic plants, increased predation by ravens, and collecting as pets.

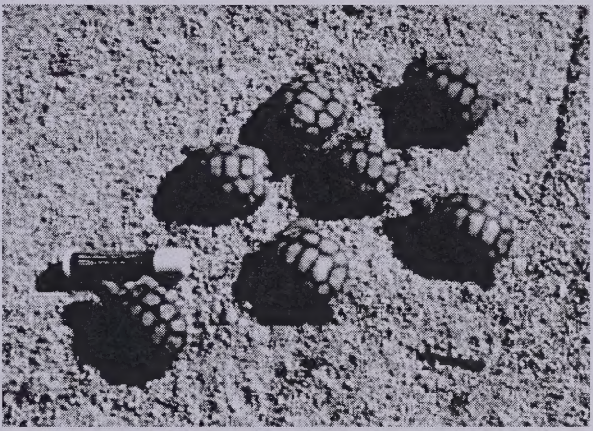
Photo Credit: BLM, 2007

Legal Protection

Desert tortoises are protected by the Federal and California Endangered Species Acts. Federal and state protection makes it illegal to “take” desert tortoises or destroy habitat without an exemption. Take means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” If you encounter a desert tortoise *DO NOT TOUCH IT*! Report the observation immediately to the Designated Biologist, or Biological Monitor, or the project office in the Construction Logistics Area.

You can be penalized for damaging tortoise habitat, if it is the result of unauthorized activity. An example is driving off designated roads. Maximum fines are $100,000 for an individual, $200,000 for an organization (such as a business or corporation) and up to one year in prison. **You and your company are responsible for obeying the law.**

Where Desert Tortoises May be Found

Desert tortoise could be encountered anywhere on the DHSP site. Be particularly watchful on roads. Desert tortoises may be found in burrows up to 30 feet in length. Burrows are difficult to detect and therefore driving and walking will be limited to designated roads and within the fence line of the project.

Tortoises are most active from mid-February through late June and again during September and October. They may also be active during the summer, but usually don’t range far from their burrows when temperatures are very hot. Tortoises are particularly active during or following rainfall. **Tortoises may use parked vehicles and construction equipment for shade during the heat of the day.**

Juvenile and adult tortoises may be active throughout the year and at night; activity is seasonally variable. Hatchling tortoises are about the size of a silver dollar and may be abundant in the fall. Speed limits must be observed because these small tortoises are hard to see.

What you must do

- Stay within the fenced construction areas that have been cleared of tortoise and on existing roads. Travel outside of the fenced area is strictly prohibited.
- Preconstruction tortoise clearance surveys must be conducted prior to all ground disturbances. Be sure that any work area has been cleared of desert tortoises and approved for ground-disturbing activities by the Designated Biologist before starting work.
- The Designated Biologist or Biological Monitor shall be present at the site during all project activities that have potential to disturb soil, vegetation, or wildlife.
- Staying on designated roads and within the staked project limits. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 15 miles per hour.
- Firearms and pets are prohibited on the job site.
- Remove left-over food and garbage and place in self-closing animal-proof containers. Otherwise, this garbage could attract wildlife (e.g., ravens) and other predators that feed on young tortoises. At least one self-closing waste container will be located at any break area. You are responsible for making sure your waste is properly disposed of. If needed, waste may be kept in a closed vehicle until the end of a shift, and then placed in a raven-proof container.
- Pick up any food, food wrappers, or other trash that could attract wildlife. Trash bags will be supplied in every vehicle.
- Check under/around your vehicle and all equipment before moving it because a tortoise may be using it for shade. If one is observed, the tortoise must be allowed to move away on its own and immediately reported to the Designated Biologist. Only a Designated Biologist with a permit for this species can move the tortoise out of the construction area. Designated Biologists serve as additional contacts to report tortoise sightings or accidents.
- If you encounter a desert tortoise DO NOT TOUCH IT AND NOTIFY THE DESIGNATED BIOLOGIST IMMEDIATELY.

Mojave Fringe Toed Lizard

The Mojave fringe-toed lizard is a medium-sized, white or grayish, black-spotted lizard. It has scaly hind toes that keep it from sinking into the sand and has been clocked at speeds of 23 miles per hour. Be careful, as this lizard may dart in front of your vehicle. The lizard also tends to plunge into the sand to hide from enemies. However, they do not burrow deep enough to be out of harm's way from vehicles.

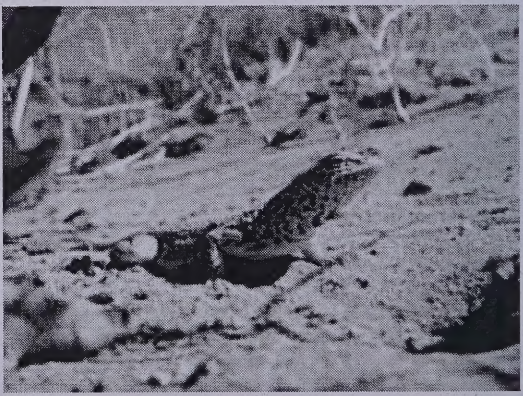

Photo Credit: Robert Black, 2010

The lizard lives in windblown sandy habitats, most notably sand dunes. There is no dune habitat within the project footprint but dune habitat is located east of the site and this lizard may wander up sandy washes into the DHSP site. Due to their coloring, the lizard may blend into the sand. Lizards could be harassed, crushed, buried, or stranded if they wander into the site during construction.

American Badger

Photo Credit: USFWS, 2008

American badgers have stocky bodies with short, powerful legs and large foreclaws. Their heads are covered with coarse fur and have a distinctive black and white pattern on their faces. American badgers, a California Species of Special Concern, were once fairly widespread throughout open habitats of California. They are now uncommon, year-round residents throughout most of the state, with the exception of the northern North Coast area. They are most abundant in the drier open shrub, forest, and herbaceous habitats with friable soils (soils that allow burrowing). The American badger may den or forage in the vicinity of the project site.

Desert Kit Fox

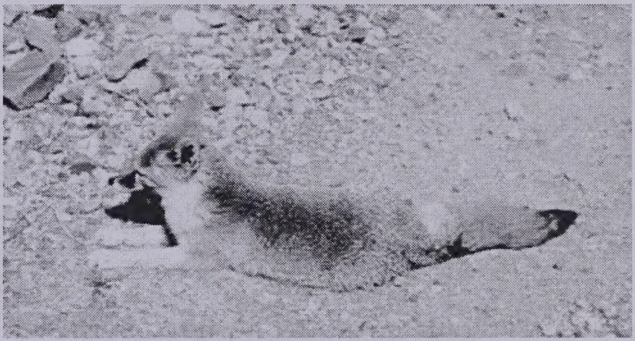

Photo credit: NPS, 2012.

Desert kit foxes have a "foxy" appearance with long ears, long legs, and a delicate body; they have fur on the soles of their feet forming a "sand shoe". The kit fox lives on the open desert, on creosote bush flats, and amongst the sand dunes. Kit foxes are primarily nocturnal and inhabit open, level areas with patchy vegetation cover. They also require friable soils for construction of dens. Their dens have several entrances and a kit fox will usually have several dens within its home range. Desert kit foxes can run at speeds of 25 miles per hour. Please follow all posted speed limits as kit foxes have been observed within the project area.

Roosting Bats

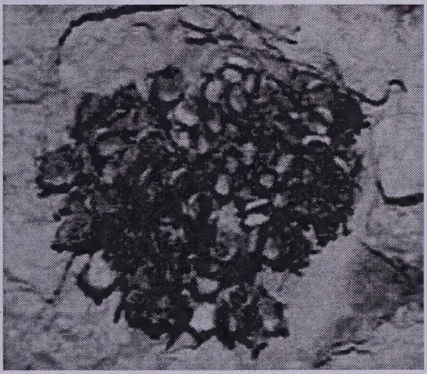

Photo Credit: USFWS, 2011

A number of bat species may either forage or roost within the project site. Bats often roost in rock crevices, tunnels, or caves and one species (western yellow bat) may roost in desert ironwood or palo verde trees. Bats life histories vary widely with some hibernating during winter, and others migrating south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites. All special-status bats in the region eat insects and some forage over open shrublands such as found on the DHSP site.

Palm Springs Round-Tailed Ground Squirrels

Photo Credit: Gerald and Buff Corsi © 1999 California Academy of Sciences

Round-tailed ground squirrels are relatively small in comparison to other ground squirrels. They have small rounded heads with small ears and large dark eyes. They are even in coloration and include gray, pinkish cinnamon, and pale cinnamon brown. Palm Springs round-tailed ground squirrel is a CDFG Species of Special Concern and a BLM Sensitive Species. Its primary habitat is mesquite hummocks and sand dunes and to a lesser degree dunes and hummocks associated with creosote bush. Ground squirrels have been observed near the gen-tie and on the project site.

Nelson's Bighorn Sheep

Photo Credit: NPS, 2012

Nelson's bighorn sheep is a BLM Sensitive Species. The males can be recognized by massive brown horns that curl back over their ears. The females are smaller than the males and have shorter, smaller horns. Current and/or historic populations are found in the mountain ranges in the general project region, including near the Eagle, Coxcomb, Chuckwalla, Granite, and Northern Palen Mountains. Nelson's bighorn sheep are likely to use habitat on the site intermittently during winter, especially as a movement corridor among regional mountain ranges. Threats to Nelson's bighorn sheep include habitat loss or degradation, limited availability of water sources, barriers to local or regional movement, disease spread by domestic livestock, and natural predation by mountain lions in some populations.

What You Must Do

- Stay within the designated construction areas.
- Avoid all undisturbed areas and preserve vegetation by staying on designated roads and within the staked project limits.
- If you see a Species of Concern, report it to the Designated Biologist or Biological Monitors immediately.
- Do not touch any wildlife.
- Obey posted speed limit signs within the project site.

Nesting and Foraging Birds

The DHSP site and vicinity supports nesting habitat and foraging habitat for many native raptors (eagles, hawks, and owls) and songbirds.

What you should know about Nesting and Foraging Birds

Birds generally breed and nest between February 1st and September 1st. Except for a limited few, all birds, nests, eggs, and young are protected under California Fish and Game laws and by the Federal Migratory Bird Treaty Act. You may not harm native birds or damage a bird's nest or eggs. An offense is considered criminal and can include substantial fines and possible jail time. Be mindful that not all nests are in trees — many species nest in shrubs, on the ground, or even on structures or construction equipment. Some raptor species may nest in the mountains surrounding the project site to the north and south and some species may nest on the project site. The project site also provides foraging habitat for a number of raptor species.

What you must do

- Stay out of designated areas that are temporarily off limits because of nesting birds. Work areas will be surveyed for nesting birds prior to and during construction. If an active nest is found, the immediate area will be temporarily off limits. Active nests will be cordoned off and monitored by the Designated Biologist who will also give approval to re-enter the area following fledging of nestling birds.
- Respect the buffer zones established by the Designated Biologist or Biological Monitor.
- If you see nests prior to or during construction, notify a Designated Biologist or Biological Monitor immediately. Nests may be found in trees, bushes, man-made structures (e.g., storage areas), non-moving equipment, or on the ground in burrows (e.g., burrowing owls).

Burrowing Owls

The Western burrowing owl, a California Species of Special Concern, inhabits dry open grasslands and typically nests in small burrows that have been constructed and abandoned by burrowing mammals such as ground squirrels or badgers. Burrowing owls could nest onsite and may forage throughout the project area. Burrowing owls may be found on the site at any time of year; their breeding season is late February through August. Juvenile and adult burrowing owls have been killed from destruction, plugging, and flooding of their burrows, collisions with motor vehicles and construction equipment, predation by native and domestic animals, exposure to certain insecticides and rodenticides, and shooting.

Photo Credit: USFWS, 2010

Golden Eagles

The golden eagle is a BLM Sensitive Species, and considered a bird of conservation concern by the USFWS. It is also Fully Protected in California, and is covered under the MBTA and California Fish and Game Code. Golden eagles are year-round residents throughout most of their range in the western United States. In the southwest, they are more common during winter when eagles that nest in Canada migrate south into the region. They breed from late January through August, mainly during late winter and early spring in the California deserts. In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees that are used as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests. Golden eagles nest in the mountain ranges surrounding the project and they may hunt on the project site Their main prey is rabbits and ground squirrels.

Photo Credit: USFWS,

6.3 Special-Status Plants

Several public agencies and private entities maintain lists of plants of conservation concern. The CDFG compiles these in its compendia of "Special Plants." These plants are treated here as "special-status species."

Crucifixion Thorn (*Castela emoryi)*

Photo Credit: BLM, 2011

Crucifixion thorn is found in the Sonoran and southern Mojave Deserts of the American southwest. It is widely scattered in southwestern Arizona; its scattered occurrences in the California deserts are the western extent of its range. It also occurs at a few sites in northwestern Sonora, Mexico, and in northern Baja California. Crucifixion thorn is a leafless shrub or small tree of washes, non-saline dry lakes, and other sites where water accumulates. The plants are long-lived and densely thorny. The stems are light gray-green, rigid, ascending (directed upward) with stout spine-tipped twigs. Its flowers are inconspicuous and abundant. The fruits, after maturing, remain on the plant for several years. Young plants, prior to fruiting, do not have the characteristic clustered fruits of older plants. Plants occur as scattered colonies, possibly clones, of fairly small size that do not extend far across the landscape.

Utah vine milkweed (*Cynanchum utahenses*)

Utah vine milkweed is an herb that lives for multiple years and dies back to the ground in the summer. It is a small vine with a branched, twining stem that rarely grows beyond a meter in length. It has small narrow leaves a few centimeters long and bright yellow to orange flowers. It ranges from the California deserts to southwestern Utah. Its habitat is desert washes and canyons. It was recorded on and near the project site.

Photo Credit: © 2011, Justin M. Wood.

Desert unicorn-plant (*Proboscidea althaefolia*)

Photo Credit: © 2011 Neal Kramer

Desert unicorn-plant, also called "devil's claw," is a long-lived herb that grows from a large roost stock. It is dormant in spring, but sprouts in response to warm season rains. It ranges throughout much of the Sonoran Desert, eastward to Texas and parts of mainland Mexico. It is noticeable for its woody, hook-shaped fruits (pods), that are evidently dispersed by clinging to fur or hooves of large mammals. Desert unicorn-plant was located at several sites near the project site.

What you must do

- Stay within the designated areas that are marked with highly visible and weather resistant fencing/ flagging (e.g., orange construction fencing or staking).
- Respect the buffer zones established by the Designated Biologist or Biological Monitor.
- When possible, use a drive and crush method rather than grading to minimize damage to the roots of desert plants.
- Do not collect any plants onsite.
- Avoid bringing in invasive and non-native weeds.

7. Weed Avoidance and Control

Under direction of the Bureau of Land Management, enXco has prepared a comprehensive Integrated Weed Management Plan to assure that construction activities, as well as operation of the DHSP, do not promote weed growth in the area, nor lead to the establishment of new weed species in the area. Weeds are usually annual plants that prefer disturbed soil conditions, and their seeds commonly hitchhike on the tires and undercarriage of heavy equipment as well as cars and trucks. They can have devastating effects to local ecosystems because a heavy growth of weeds promotes wildfires in vegetation not adapted to fire. Such a catastrophe could seriously affect the facility, and the surrounding native vegetation may never return after such a fire. The proliferation of certain weeds can potentially lead to the local extinction of native plant species. Therefore, for the safety of the facility as well as the health of the surrounding ecosystem, enXco has adopted strict weed-control measures that you are required to follow.

These include the following:

- **Monitor materials onsite.** Biological monitors will be present at the site and will closely monitor the types of materials brought onto the site. Only weed-free straw or hay bales used for sediment barrier installations.

- **Early Detection.** The Designated Biologists, Biological Monitors, or Qualified Botanists may identify areas where weeds appear to be taking over. Weed infestations must be controlled or eradicated as soon as possible upon discovery, and before they go to seed, to prevent further expansion.
- **Limiting Disturbance.** Because weeds thrive on recently disturbed soils, any vegetation and/or ground disturbance will be limited to the absolute minimum needed and entrance/exit of the site will be limited to designated routes.

Notes

[The Certificate of Completion will be printed on three-part paper and bound into the booklet.]

Attachment 1: Certificate of Completion

I certify that I have received training at a worker education session prior to beginning work on this project. During that session, I was provided information about the biology, habitat needs, status under the federal and state endangered species acts, and measures being taken for the protection of the threatened and endangered species that may occur in the project area. I also received instruction about the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The training described the need to comply with conditions placed on the project by the Bureau of Land Management as well as state and federal agencies to protect other sensitive resources in the project area, including plants and animals that are not listed, cultural and paleontological resources, and human remains.

I also understand that whenever I am at the jobsite, I am to have this worker education booklet with me, including the signed copy of this form documenting that I have received the training.

I have read and understand the measures that I am personally responsible for following and I am aware that I may incur civil and/or criminal penalties if I do not conform to the required measures.

Name (Please print)

Signature

Dates of Sessions

Instructions: Fill out this form. Keep your copy in the booklet and give the other two to the class instructor. Add dates when you receive retraining.

Attachment 2 - WILDLIFE OBSERVATION FORM

To Record Animals Found In the DHSP Area

To be filled out by personnel who find active nest sites and burrows, dens, and dead or injured wildlife, or other biological resources during construction activities.

Name of employee:

Date:

Location of observation:

Wildlife species:

Condition of wildlife: ☐ Alive ☐ Dead

Possible cause of injury or death:

Where is the animal currently?

Is the resource in danger of project (or other) impacts?

Comments:

Please contact the Designated Biologist for questions and to report any wildlife, nest, or den in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Game (CDFG) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts.

Appendix C.16

Gen-Tie Biological Resources Technical Report Supplement

Biological Resources Technical Report Supplement
Desert Harvest Solar Project
Generator Tie-line Alignment Alternative E

Prepared for:

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July 2012

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Attachments

Attachment 1. CNDDB Search Results
Attachment 2. Species List
Attachment 3. CNDDB Native Species Field Survey Forms

ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
CBOC	California Burrowing Owl Consortium
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CTNA	Crucifixion Thorn Natural Area
DHSP	Desert Harvest Solar Project
DSSF	Desert Sunlight Solar Farm
DWMA	Desert Wildlife Management Area
ESA	Endangered Species Act
GIS	Geographic Information System
GPS	Global Positioning System
JTNP	Joshua Tree National Park
MBTA	Migratory Bird Treaty Act
USFWS	US Fish and Wildlife Service
WHMA	Wildlife Habitat Management Area
WRCC	Western Regional Climate Center

PROJECT OVERVIEW

The Desert Harvest Solar Project (DHSP) site is located in the upper Chuckwalla Valley, in unincorporated Riverside County, approximately 6 miles north of Desert Center, California. The proposed project consists of a solar generator facility to be located on public lands administered by the Bureau of Land Management (BLM), and a generator tie-line (gen-tie) to transmit electrical power to the Red Bluff Substation now under construction, about 5 miles east of Desert Center and south of the Interstate-10 Freeway. The Desert Sunlight Solar Farm (DSSF), now under construction, is located to the immediate north of the Desert Harvest site (Figure 1) and the DHSP proposed gen-tie line would be on shared poles with that project's gen-tie line. Biological resources on the DHSP solar facility site, the proposed gen-tie line alignment, and two alternative gen-tie alignments, were described in a Biological Resources Technical Report (BRTR; Aspen and AMEC 2012), in the DHSP Draft Environmental Impact Statement (DEIS; BLM 2012), and in the Desert Sunlight Solar Farm Final EIS (BLM 2011a).

This BRTR Supplement addresses only alternative generator tie-line (gen-tie) E. The alignment is 11.4 miles in length and is located on private lands owned by the Metropolitan Water District of Southern California (MWD) and on public land managed by the BLM (Figures 1 and 2). The alignment is now undeveloped, natural open space. The surrounding area consists primarily of MWD and BLM lands, with scattered smaller private land parcels throughout the upper Chuckwalla Valley. Some of the private lands adjacent to the alignment have been developed as residential and agricultural lands uses. These include active and inactive jojoba fields and rural residential lands.

Portions of the alignment are within areas designated as special management areas for wildlife. These include 4.3 acres in the Chuckwalla Desert Wildlife Management Area (DWMA); 51.8 acres in the Palen-Ford Wildlife Habitat Management Area (WHMA); and 1.8 acres in the desert tortoise Chuckwalla Critical Habitat Unit (CHU; this area overlaps with the Chuckwalla DWMA, above). These wildlife management areas are described in Section 3.4.1 of the DEIS and mapped on Figure 3 of this BRTR supplement.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest solar facility site and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

SUMMARY OF FIELD SURVEYS

This BRTR Supplement describes the methods and results of field surveys conducted by Aspen Environmental Group (Aspen) biologists on gen-tie alignment Alternative E, including prior field work described in the DHSP BRTR (Aspen and AMEC 2012) and new field work completed in 2012. The reports and field surveys summarized in this BRTR are listed below.

- Streambed Delineation and Vegetation Map: Vegetation mapping of gen-tie alignment Alternative E was completed by Aspen biologists Justin Wood and Dustin Ray in October 2011, as described in the BRTR and summarized in this Supplement. Delineation of jurisdictional streambeds on gen-tie alignment Alternative E was completed in 2012 by Aspen biologists Jared Varonin, Justin Wood, and Tracy Valentovich.

- Special-Status Plant Surveys: Fall field surveys for special-status plants were conducted 2011 by Justin Wood and Dustin Ray. Spring field surveys for special-status plants were completed in 2012 by Jared Varonin, Justin Wood, and Tracy Valentovich.
- Desert Tortoise Surveys: Focused surveys for desert tortoise were conducted over 100% of the alignment during spring 2012 by Jared Varonin, Justin Wood, and Tracy Valentovich, in accordance with US Fish and Wildlife Service (USFWS) survey protocol (2010a).
- Mojave Fringe-toed Lizard Habitat Evaluation: Herpetologist Robert Black evaluated habitat suitability for Mojave fringe-toed lizard during spring 2012.

In addition to these field surveys and reports, Aspen biologists reviewed the California Natural Diversity Data Base (CNDDB; California Department of Fish and Game, CDFG 2012) and California Native Plant Society (CNPS) Electronic Inventory (2012) to identify special-status plants, animals, and plant communities known from the area. The CNDDB report is included here as Attachment 1. We also reviewed applicable documents pertaining to the DHSP (BLM 2012) and DSSF (BLM 2011). All plant and animal species observed in the field were identified and recorded in field notes. A list of all plant and animal species noted on the alignment is included here as Attachment 2.

VEGETATION, HABITAT, AND JURISDICTIONAL STREAMBEDS

Methods

Aspen biologists Justin Wood, Dustin Ray, and Jared Varonin mapped vegetation on gen-tie alignment Alternative E during September and October 2011. Mapping of the streambeds along gen-tie alignment Alternative E was completed by Varonin, assisted by Wood and Tracy Valentovich, in April and May 2012 (Table 1). All field surveys address the 400-foot wide corridor along the length of the alignment.

Table 1. Vegetation, Habitat, and Jurisdictional Streambed Field Survey Staff and Field Dates.

Date	Field Staff
4 Oct 2011	Justin Wood, Jared Varonin, Dustin Ray, Scott White
5 Oct 2011	Justin Wood, Jared Varonin
19 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
20 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
23 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
24 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
10 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
11 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
17 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
18 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich

Vegetation

Vegetation was mapped as Geographic Information System (GIS) shapefiles with a minimum mapping unit of about 0.15 acres (6,500 square feet) on aerial imagery (USDA 2009 and 2010 NAIP Imagery: http://datagateway.nrcs.usda.gov/GDGHome.aspx, resolution of 1 square meter). The vegetation map

(Figure 4) and text descriptions (below) were field verified in conjunction with the streambed delineation. All GIS information was digitized in the NAD 83 datum using the California State Plane Zone VI projection to ensure local accuracy when calculating area.

Any vegetation map is subject to imprecision for several reasons:

1. Vegetation types intergrade on the landscape so that there are no true boundaries in the vegetation itself. In these cases, a mapped boundary represents best professional judgment.
2. The published nomenclature and descriptions tend to intergrade; that is, a given stand of vegetation may not match any named type in the classification scheme used. Each polygon is labeled according to the most applicable type in the classification, but there is often some ambiguity among the types.
3. Vegetation tends to be patchy. Small patches of one type are often surrounded by another type. The size of these included patches varies, depending on the minimum mapping units and scale of available aerial imagery.
4. Photo interpretation of visually similar vegetation types may be difficult.

State Jurisdictional Streambed Delineation

All streambeds or washes potentially meeting jurisdictional criteria as Waters of the State were delineated by walking the center line along the entire length of the alignment. The width of each potentially jurisdictional channels or wash was estimated and a GPS point was taken to record latitude and longitude. The GPS data and channel widths were converted into a GIS shapefile. The total jurisdictional streambed acreage along the 400-foot wide and approximately 11.5 mile long alignment was calculated as the summed area of jurisdictional channels (i.e., summed length x width of all channels) plus the acreage of adjacent riparian vegetation. Some drainages near the outer margins of the 400-foot wide alignment, not crossing the center of the alignment, may not have been recorded during the delineation.

Results

Vegetation

Four vegetation and habitat types were mapped on the gen-tie alignment Alternative E (Figure 4): Creosote Bush Scrub, which is found on bajada surfaces and on partially stabilized aeolian sands; Blue Palo Verde-Ironwood Woodland; and active dunes. The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo-Verde-Ironwood Woodland is a subset of his description of Desert Dry Wash Woodland. There also are small areas on the alignment where natural vegetation has been removed or disturbed for roads and other land uses. In most cases (e.g., narrow roads), these areas are too small for mapping at this scale. However, we mapped 5 acres of roadways and disturbed areas on the 400-foot wide alignment.

Creosote Bush Scrub (Bajada/Alluvial Landforms): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance; Sawyer et al. 2009) on the alignment is characterized by low shrub species diversity and relatively wide spacing of shrubs, usually with bare ground between. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), cheesebush (*Hymenoclea salsola*), and big galleta (*Pleuraphis rigida*). This vegetation also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). We mapped 32 acres of Creosote Bush Scrub on bajada/alluvial landforms on the 400-foot wide alignment. Creosote Bush Scrub has no California Department of Fish and Game special-status designation (CDFG 2010).

Creosote Bush Scrub on the alignment matches the Desert Scrub wildlife habitat described by Laudenslayer and Boggs (1988). It provides habitat for wildlife species typical of the California deserts, including burrowing species such as kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* and *Chaetodipus* spp.), and desert cottontail (*Sylvilagus audubonii*); and mesopredators such as desert kit fox (*Vulpes macrotis arsipus)* and coyote (*Canis latrans*). This community also serves as habitat for numerous species of reptiles including desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidocelis tigris tigris*) and zebra-tailed lizard (*Callisaurus draconoides*). Common birds observed within this vegetation included black-throated sparrow (*Amphispiza bilineata),* Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Creosote Bush Scrub (Partially Stabilized Sand Fields): Creosote Bush Scrub vegetation occurs on partially stabilized sand fields in the eastern portion of gen-tie Alternative E. This area is located at the western margin of a much larger dune system associated with Pinto Wash, at the base of the Coxcomb Mountains. This vegetation matches the description of Creosote Bush Scrub, above, but the cover is much sparser and the substrate consists of partially stabilized sand fields with accumulations of sands mounded at the bases of the shrubs. This habitat type is suitable for a series of special-status plants and animals, including Mojave fringe-toed lizard (below).). We mapped 85 acres of Creosote Bush Scrub on partially stabilized sand field landforms on the 400-foot wide alignment. Acreage impacted by Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Blue Palo Verde-Ironwood Woodland: Blue Palo Verde-Ironwood Woodland (*Parkinsonia florida-Olneya tesota* Woodland Alliance; Sawyer et al. 2009) occurs throughout the project vicinity, primarily in dry washes, and is characterized by the presence of desert ironwood (*Olneya tesota)* and blue palo verde (*Parkinsonia florida*). Additional tree species such as smoketree (*Psorothamnus spinosus*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. This vegetation is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland 1986; Schoenherr and Burk 2007). Vegetation in desert washes is generally taller, up to approximately 9m (30 ft) in height, and denser than in surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of big galleta, cheesebush, desert lavender (*Hyptis emoryi*) and other shrubs and subshrubs.

Blue Palo Verde-Ironwood Woodlands on the site match the desert wash wildlife habitat described by Laudenslayer (1988). This habitat provides more food, nesting, and cover resources than the surrounding Creosote Bush Scrub, and wildlife diversity is generally greater than in the surrounding desert. Examples of species that depend in part on desert microphyll woodlands include vermilion flycatcher (*Pyrocephalus rubinus*), black-tailed gnatcatcher (*Polioptila melanura*), and burro deer (*Odocoileus hemionus eremicus*) (below). In addition, many of the species occupying the surrounding Creosote Bush Scrub are found in greater numbers in microphyll woodlands. This community is ranked by CDFG (2010) as a special-status vegetation type, with state rarity ranking of S3. We mapped 388 acres of Blue Palo Verde–Ironwood Woodland on the 400-foot wide alignment. Acreage impacted by

Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Active Sand Dunes: Active sand dunes are located at the western margin of the larger Pinto Wash / Coxcomb Mountains dune system. This habitat type is characterized by fine aeolian (i.e., wind-blown) sands that support very little vegetation. Vegetation on the dunes is sparse. Allscale (*Atriplex polycarpa*) is the dominant plant in the most active portions of the dunes, and the less active areas are dominated by creosote bush. Numerous native annuals and perennial are also present; these include freckled milk-vetch (*Astragalus lentiginosus* var. *variablis*), dune primrose (*Oenothera deltoides*), desert lily (*Hesperocallis undulata*), Harwood's woolly-star (*Eriastrum harwoodii*), and desert sand verbena (*Abronia villosa* var. *villosa*). We mapped 47 acres of active sand dunes on the 400-foot wide alignment. Impacts acreage would be dependent on the specific locations of access roads, transmission line structures, and work sites.

State Jurisdictional Streambed Delineation

The CDFG regulates alterations to state-jurisdictional streambeds ("waters") under Section 1600 et seq. of the California Fish and Game Code. Jurisdictional acreage is interpreted as the bed and banks of channels and adjacent riparian vegetation. In the Chuckwalla Valley area, the Blue Palo Verde - Ironwood Woodland (described above; see Figure 4) is the regional riparian vegetation type. Due to the abundance and close spacing of braided channels throughout the area, all mapped Blue Palo Verde-Ironwood Woodland is adjacent to one or more channels. The CDFG jurisdictional streambeds are mapped on Figure 5.

Total acreage of jurisdictional areas within the 400-foot wide alignment is calculated as the sum of mapped Blue Palo Verde - Ironwood Woodland (388 acres) plus the acreage of any jurisdictional streambeds mapped outside those woodlands (less than one acre), totaling 388 acres within the alignment. Actual project impacts to jurisdictional areas would be much less than this, and would depend on the specific locations of access roads, transmission line structures, and work sites. Construction of an access road for gen-tie alignment Alternative E would likely impact state-jurisdictional streambeds along the entire length of the alignment. Tower sites and other work areas could impact additional jurisdictional areas, depending on their specific locations.

SPECIAL-STATUS SPECIES

Methods

Special-Status Plants

Field surveys for special-status plants on the alignment were completed during fall 2011, concurrently with vegetation mapping field work, and during spring 2012, concurrently with field surveys for other resources, including desert tortoise. Field survey dates and personnel are listed below in Table 2.

Table 2. Field Dates and Survey Staff

Season / Project Component	Date	Field Staff
Fall botanical surveys and vegetation mapping	4 Oct 2011	Justin Wood, Jared Varonin
	5 Oct 2011	Justin Wood, Jared Varonin
	13 Oct 2011	Justin Wood, Dustin Ray
	14 Oct 2011	Justin Wood, Dustin Ray

Season / Project Component	Date	Field Staff
Spring surveys (special-status plants, desert tortoise, desert kit fox, burrowing owl, and other resources)	19 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	20 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	23 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	24 Apr 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	10 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	11 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	17 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
	18 May 2012	Justin Wood, Jared Varonin, Tracy Valentovich
Spring survey (Mojave fringe-toed lizard habitat delineation)	25 Jun 2012	Tracy Valentovich, Robert Black

The distribution and abundance of many fall-flowering species in the California desert is incompletely documented in literature due to a historic emphasis on spring, rather than fall, field work. Yet a significant proportion of the flora is made up of annual species that germinate in response to summer rains, or perennial herbs that may flower at any time of year, depending on rainfall (Shreve and Wiggins 1964; Phillips and Comus 2000). Therefore, botanical surveys were conducted during both spring and fall, to find and identify as many species as possible and to maximize the likelihood that species not known from the area, or not included on a list of "target species" would be documented if they occur on the site. This approach to field work conforms to CDFG (2009) and BLM (2009) guidelines recommending "floristic" botanical surveys and provides the most thorough practicable botanical inventory of the alignment.

Prior to field surveys, Aspen biologists reviewed available literature to identify special-status biological resources known from the vicinity of the project site. The literature and databases listed below were reviewed.

- CNDDB (CDFG 2012a) for the following 7½-minute USGS topographic quads: Victory Pass, East of Victory Pass, Desert Center, Corn Spring, , Palen Lake, and Sidewinder Well;
- CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2012), for the same topographic quads;
- NECO Plan (BLM and CDFG 2002);
- List of California BLM Sensitive Plants (BLM 2010a);
- Recent environmental documents for nearby projects including the adjacent Desert Sunlight Solar Farm Project (BLM 2011b), the Palen Solar Power Project (BLM 2011c), the Genesis Solar Energy Project (BLM 2011d), and the Desert Harvest DEIS (BLM 2012).

Based upon review of the literature and database above, a list of special-status plant species with potential to occur in the vicinity of the proposed project was compiled. Plant taxa were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA);
- Listed as threatened or endangered, or candidates for listing under the California Endangered Species Act (CESA);
- Designated by BLM as Sensitive Plants: "all plant species that are currently on List 1B of the CNPS Inventory of Rare and Endangered Plants of California, are BLM sensitive species, along with others

that have been designated by the California State Director" (BLM 2009; note that the CNPS Lists are now known as California Rare Plant Ranks, or CRPR);

- Listed as rare under the California Native Plant Protection Act;
- Meet the definition of rare or endangered under CEQA §15380 (b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

Table 3 presents the special-status plant species known from the region and summarizes their natural history, agency status, and probability of occurrence on the project site.

Table 3. Special-Status Plants of the Chuckwalla Valley Area.

Special-Status Plant Species	Habitat and Distribution	Flower Season	Conservation Status	Occurrence Probability
Abronia villosa var. *aurita* Chaparral sand verbena	Annual or perennial herb; sand, about 250-5300 ft. elev.; San Jacinto Mtns, Inland Empire, adj. Colorado Des, Orange & San Diego cos; mostly alluvial fans and benches in western Riverside Co; dunes in deserts; not rare in the deserts	Feb. - July	Fed: none BLM: Sensitive Calif: S2 CRPR: 1B.1	High in aeolian sand; low in washes or roadsides; habitat suitable, but not seen during surveys
Ammoselinium giganteum Desert sand-parsley	Annual; only known Calif. location at Hayfields Dry Lake, about 1300 ft. elev.; heavy soils, beneath shrubs; also to AZ and Mainl. Northern Mexico	March - April	Fed: none BLM: none Calif: SH CRPR: 2.3	Minimal; no suitable dry lakebed habitat
Androstephium breviflorum Pink funnel-lily, small-flowered androstephium	Bulb; Mojave Des shrublands; stabilized dunes or sandfields, about 700-5300 ft. elev.; scattered in Calif., N Ariz., S Nevada, to W Colorado	March-April	Fed: none BLM: none Calif: S2/S3 CRPR: 2.3	Low in aeolian sand, otherwise not expected; not observed during field work
Astragalus insularis var. *harwoodii* Harwood's milk vetch	Annual; sand, mainly dunes, also washes and slopes; below about 1200 ft. elev.; SE Calif. to Ariz., Baja and Sonora	Jan. - May	Fed: none BLM: NECO Calif: S2.2? CRPR: 2.2	Moderate to high in aeolian sand; low in washes or roadsides; habitat suitable, but not seen during surveys
Astragalus lentiginosus var. *coachellae* Coachella Valley milk-vetch	Annual or perennial herb; open sand, gen. dunes but also wash margins; below about 2200 ft. elev.; endemic to Coachella Valley; formerly reported from Chuckwalla Valley, those populations now recognized as *A. l.* var. *variabilis* (speckled milk-vetch)	Feb. - May	Fed: **END** BLM: Sensitive, NECO Calif: S2.1 CRPR: 1B.2	Minimal; outside geographic range

Special-Status Plant Species	Habitat and Distribution	Flower Season	Conservation Status	Occurrence Probability
Ayenia compacta Ayenia	Perennial herb; desert shrubland, gen. rocky sites, washes and mountain slopes below about 3600 ft. elev.; W low desert margins, Chuckwalla Valley, and E Mojave; also Baja Calif. and Sonora (Mexico)	March - April	Fed: none BLM: none Calif: S3? CRPR: 2.3	Low-moderate; washes are marginally suitable; not seen during field surveys.
Cassia – see *Senna*				
Castela emoryi Crucifixion thorn	Shrub; widespread but rare, Calif. deserts to Ariz., Baja and Sonora; fine sand or silt, washes, plains, non-saline bottomlands, about 350-2100 ft. elev.	June-July	Fed: none BLM: NECO Calif: S2/S3 CRPR: 2.3	Low; not seen on alignment during field surveys; see text
Chamaesyce abramsiana (*Euphorbia abramsiana*) Abrams' spurge	Annual; sandy flats; about sea level to 3,000 ft. elev.; East Mojave desert, JTNP, and low desert, to Arizona and Mexico		Fed: none BLM: none Calif: S1.2 CRPR: 2.2	High in aeolian sand; low in washes or roadsides
Colubrina californica Las Animas colubrina	Shrub; scattered mtn ranges of the low desert, incl. JTNP, Eagle Mtns, Chuckwalla Mtns, etc.; about 1100-3900 ft. elev.; rare in Calif., more common in Ariz. and Mexico	April - May	Fed: none BLM: NECO Calif: S2/S3.3 CRPR: 2.3	Low; field survey results
Coryphantha alversonii (*C. vivipara* var. *alversonii*; *Escobaria vivipara* var. *alversonii*) Alverson's foxtail cactus	Cactus; desert scrub, S Mojave and Sonoran Deserts, about 250-5000 ft. elev.; Riverside, San Bernardino, and Imperial cos., to Arizona	May - June	Fed: none BLM: NECO Calif: S3.2 CRPR: 4.3	Low; field survey results; bajada site may be unsuitable habitat
Cryptantha costata Ribbed cryptantha	Annual; windblown and stabilized sand, desert shrublands; E Mojave and Sonoran Deserts , to Arizona & Baja; below sea level to about 1650 ft. elev.	Feb. – May	Fed: none BLM: none Calif: S3.3 CRPR: 4.3	Occurs in dunes; low potential in washes or roadsides
Cynanchum utahense (*Funastrum utahense*) Utah vine milkweed	Climbing perennial herb; sandy or gravelly soils, E and S Mojave Des through JTNP and Anza-Borrego regions, to S Nevada, NW Ariz., and SW Utah; about 500 - 4700 ft. elev.	April-June	Fed: none BLM: none Calif: S3.2 CRPR: List 4.2	High; suitable habitat throughout; not seen during field surveys
Ditaxis claryana (*D. adenophora*) Glandular ditaxis	Perennial herb. Conflicting info. in literature. Sandy soils below about 350 ft. elev.; or rocky uplands & sandy washes to 3000 ft.; widely scattered, Sonoran Desert, Calif. to Ariz. and mainland Mexico	conflicting lit. reports	Fed: none BLM: NECO Calif: S1 CRPR: 2.2	Moderate; habitat may be suitable, but not seen during field surveys
Ditaxis californica (*D. serrata* var. *californica*) California ditaxis	Perennial herb; washes and canyons, low desert and adj. mtns.; La Quinta E to Desert Center, also Anza Borrego; about 100-3250 ft. elev.	March - Dec	Fed: none BLM: NECO Calif: S2 CRPR: List 3.2	Moderate; habitat is suitable, but not seen during field surveys

Special-Status Plant Species	Habitat and Distribution	Flower Season	Conservation Status	Occurrence Probability
Eriastrum harwoodii Harwood's wollystar	Annual; partially stabilized desert dunes (San Bernardino, Riverside, and San Diego cos.); about 900 ft. to about 1700 ft. elev.	Mar-June	Fed: USFWS none BLM: Sensitive Calif: S2 CRPR: 1B.2	Occurs in dunes; low potential in washes or roadsides
Escobaria – see *Coryphantha*				
Euphorbia – see *Chamaesyce*				
Grusonia parishii (*Opuntia parishii*) Parish's club-cholla	Stem-succulent; rocky desert shrublands, East Mojave Desert, JTNP, foothills above Coachella and Chuckwalla valleys; about 1000 – 5000 ft. elev.	May - July	Fed: none BLM: none Calif: S2 CRPR: 2.2	Low; field survey results; bajada site may be unsuitable habitat
Koeberlinia spinosa var. *tenuispina* Slender-spined allthorn	Deciduous shrub; desert shrublands and washes, below about 1700 ft. elev.; central Sonoran Desert, Imperial and Riverside cos; reported on-site in CNDDB, apparently based on misidentified *Castela emoryi*	May – July	Fed: none BLM: NECO Calif: S2.2 CRPR: 2.2	Low; not seen during field surveys; see text
Matelea parvifolia Spearleaf	Low twining vine; rocky sites in desert shrublands, central and eastern deserts and Anza-Borrego State Park; S Nev., Texas, and Baja; about 1400-3600 ft. elev.	March - May	Fed: none BLM: NECO Calif: S2.2 CRPR: 2.3	Low; not seen during field surveys
Mentzelia puburela Darlington's blazing-star	Perennial herb; sandy crevices of cliffs or rocky hillslopes; scattered locations throughout eastern Mojave and Colorado Deserts; about 300-4200 ft. elv.	March - May	Fed: none BLM: none Calif: S2.2 CRPR: 2.2	Minimal; no suitable habitat
Opuntia – also see *Grusonia*				
Opuntia wigginsi Wiggins cholla	Cactus; doubtful taxon; probably a hybrid (*O. ramisissima* x *echinocarpa*), desert shrubland about 100-3000 ft. elev., scattered Colorado Des. sites, east to Arizona	March	Fed: none BLM: NECO Calif: S1? CRPR: 3.3	Low; not seen during field surveys
Penstemon pseudospectabilis subsp. *pseudospectabilis* Desert beardtongue	Perennial herb; sandy washes and rocky slopes in canyons; about 300-6400 ft. elev.; scattered locations, Mojave and Colo. Deserts in California and Arizona	Jan - May	Fed: none BLM: none Calif: S3 CRPR: 2.2	Low-moderate; habitat is suitable; not seen during field surveys.
Proboscidea althaefolia Desert unicorn-plant	Perennial herb; generally sandy soils, desert shrubland, about 500-3300 ft. elev.; Sonoran Desert to Arizona and Mexico	May - Aug	Fed: none BLM: NECO Calif: S3.3 CRPR: 4.3	Occurs
Salvia greatae Orocopia sage	Shrub; desert shrubland, washes and alluvial fans, about 100-2800 ft. elev.; Riverside & Imperial cos, endemic to Orocopia Mtns and Chocolate Mtns (doubtful report near Cadiz, San Bernardino Co)	March - April	Fed: none BLM: Sensitive, NECO Calif: S2 CRPR: 1B.3	Low - moderate; habitat may be suitable but not seen during field surveys

Special-Status Plant Species	Habitat and Distribution	Flower Season	Conservation Status	Occurrence Probability
Selaginella eremophila Desert spike-moss	Perennial herb; mountainous or hillside rock outcrops and crevices, about 600 - 3000 ft. elev.; lower desert-facing slopes of San Jacinto Mtns and adj. desert, to Texas and Baja	n/a	Fed: none BLM: none Calif: S 2.2? CRPR: 2.2	Minimal; no suitable habitat
Senna covesii (*Cassia covesii*) Coves's cassia	Low, mostly herbaceous perennial; desert washes below about 2000 ft. elev.; Colorado Des to Nevada, Arizona and Baja Calif.	April - June	Fed: none BLM: NECO Calif: S2 CRPR: 2.2	Low - moderate; habitat may be suitable but not seen during field surveys
Stylocline sonorensis Mesquite neststraw	Annual; known from only one record, near Hayfields Dry Lake, now presumed extirpated; occurs in SE Arizona and mainl. Mexico	April	Fed: none BLM: NECO Calif: SX CRPR: 1A	Minimal; apparently extirpated in Calif.
Teucrium cubense ssp. depressum Dwarf germander	Annual or perennial herb; sandy alluvium, washes, etc., below about 1300 ft. elev., scattered Sonoran Desert locations, to Texas and Baja Calif.	March - May	Fed: none BLM: none Calif: S2 CRPR: 2.2	Low - moderate; habitat may be suitable but not seen during field surveys
Wislizenia refracta ssp. *palmeri* Jackass-clover	Perennial herb or subshrub; sand flats, washes, roadsides, saltbush scrub; scattered Calif. desert locations eastward to New Mexico, sea level to about 1000 ft. elev.	April - Nov.	Fed: none BLM: NECO Calif: S 2? CRPR: 2.2	High in aeolian sand; low in washes or roadsides; otherwise not expected

General references (botany): Baldwin et al. 2002; Calif. Dept. of Fish & Game 2012a, 2012b, Calif. Native Plant Society 2012; Consortium of California Herbaria 2012; Felger 2000; Munz 1974; Shreve and Wiggins 1964; Turner et al. 1995; USFWS 2011d.

Conservation Status

Federal designations: (federal ESA, USFWS).
END: Federally listed, endangered.
THR: Federally listed, threatened.
Candidate: Sufficient data are available to support federal listing, but not yet listed.
Proposed: Formally proposed for federal status shown.

Bureau of Land Management Designations:
Sensitive: Species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. BLM Sensitive species also include all federal Candidate species and federal Delisted species which were so designated within the last 5 years, and CRPR 1B plant species that occur on BLM lands.
NECO: Special-status species addressed in the NECO Plan/EIS due to management concerns within the NECO Planning Area.

State designations**:** (CESA, CDFG)
END: State listed, endangered.
THR: State listed, threatened.
RARE: State listed as rare (applied only to certain plants).
SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.

Special-Status Plant Species	Habitat and Distribution	Flower Season	Conservation Status	Occurrence Probability

CDFG Natural Diversity Data Base Designations: Applied to special-status plants and sensitive plant communities; where correct category is uncertain, CDFG uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: All California occurrences historical (i.e., no records in > 20 years).
SX: Presumed extirpated in California.

California Native Plant Society (CNPS) Rare Plant Rank designations. Note: According to CNPS (http://www.cnps.org/cnps/rareplants/ranking.php), plants ranked as CRPR 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.

1A: Plants presumed extinct in California.
1B: Plants rare and endangered in California and throughout their range.
2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
3: Plants about which we need more information; a review list.
4: Plants of limited distribution; a watch list.

California Rare Plant Rank Threat designations:

.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

Occurs: Observed on the site by qualified biologists.
Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.
High: Habitat is a type often utilized by the species and the site is within the known range of the species.
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

Prior to the spring surveys, Aspen biologists visited reference populations of several special-status plants to confirm that they could be reliably located and identified. Prior to the 2011 fall season surveys, Aspen biologists visited reference populations of California ditaxis and slender-spined allthorn. Prior to the spring 2012 surveys, they visited Coachella Valley milk-vetch and Emory's crucifixion thorn reference sites. Coachella Valley milk-vetch is the only listed threatened or endangered plant reported from the vicinity; California ditaxis is a late-season species reported from the area (BLM 2012); Emory's crucifixion thorn is ranked as CRPR 2.3 and occurs on the DHSP solar facility site (BLM 2012). Slender-spined allthorn is ranked as CRPR 2.2 and is similar to non-reproductive Emory's crucifixion thorn plants, so that field identifications of small plants should be confirmed.

During all botanical surveys, all plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in regional references such as Shreve and Wiggins (1964), Munz (1974), and Baldwin et al. (eds., 2002). All species noted in each survey area are listed in the attached species list. In conformance with CDFG guidelines (2009), surveys were (a) conducted during flowering seasons for the special-status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the alignment, and (e) well documented, by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Locations of special-status plants will be reported to the NDDB.

Fall 2011 botanical surveys covered the entire alignment following the "intuitive controlled survey" methods, described by BLM (2009). The primary target species for these field surveys were glandular ditaxis and California ditaxis, based on recommendations in AMEC (2011a). Justin Wood, Dustin Ray, and Jared Varonin covered the entire alignment, by walking four intuitive-controlled transects (BLM 2009) along each segment of the alignment. On each segment, two biologists walked from a starting point, to an ending point, and then back. They focused on washes and any low-lying areas where runoff from summer rains would have been most concentrated. Average annual summer precipitation recorded at the Eagle Mountain weather station is 1.32 inches (3.30 cm), while rainfall during summer 2011 (July 1 through September 30) was 0.69 in (1.73 cm), about half of average. However, this was heavier than in summer 2010, and numerous occurrences of one late-flowering species, desert unicorn-plant, were recorded, and diversity of the summer-fall flora was greater than recorded in fall 2010 (BLM 2012).

Spring 2012 botanical surveys covered the entire 400-foot wide alignment according to the 100 percent coverage survey method described by BLM (2009). Justin Wood, Tracy Valentovich, and Jared Varonin Wood walked linear transects, spaced 10 meters (m) apart, over the entire ROW. Where special-status species were observed, the locations were recorded with hand-held global positioning system (GPS) devices. Average annual precipitation recorded at the Eagle Mountain weather station is 3.65 inches (9.12 cm), while the total rainfall for the 2011-2012 rainfall year (July 1 through June 30) was 1.74 in (4.35 cm), less than half of average. Diversity of the spring flora was lower than recorded during surveys nearby in spring 2010 (BLM 2012).

Special-Status Wildlife

Based upon the literature and database review described above, a list of special-status wildlife species with potential to occur in the vicinity of the proposed project was compiled. In addition to the literature sources listed above for botanical surveys, the literature review included the CNDDB's Special Animals List (CDFG 2011b). Wildlife species were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal ESA;
- Listed as threatened or endangered. or candidates for listing under CESA;
- Designated by BLM as Sensitive Animals (BLM 2010b);
- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

All special-status wildlife species identified by this literature review, and others known from the general region, are included in Table 4, which summarizes the natural history, agency status, and occurrence probability on the site for each special status wildlife species known from the region.

Table 4. Special-Status Wildlife of the Chuckwalla Valley Area.

Special-Status Wildlife Species	Habitat and Distribution	Activity Season	Conservation Status	Occurrence Probability
AMPHIBIANS				
Scaphiopus couchi Couch's spadefoot	Breeds in seasonal rainpools following summer rains; burrows in sand remainder of year; eastern Colorado Desert, generally close to Colorado River	Summer	Fed: none BLM: Sensitive, NECO Calif: SSC	Minimal; no potential rainpool habitat; outside known geographic range
REPTILES				
Gopherus agassizii (Xerobates agassizi) Desert tortoise	Desert shrublands where soil suitable for burrows; Mojave and Sonoran des. (E Calif., S Nevada, W Ariz., and Sonora, Mexico)	Spring - summer	Fed: **THR** BLM: Sensitive, NECO Calif: **THR** S2	High; no recent sign, but near known occurrences (see text)
Heloderma suspectum cinctum Banded Gila monster	Rocky outcrops in desert shrubland; scarce in scattered eastern mountain ranges of Calif. deserts; to S Nevada, W Ariz., and Mainland Mexico	warm seasons	Fed: none BLM: Sensitive Calif: SSC S1	Minimal; outside known range and bajada habitat is poorly suitable
Sauromalus obesus (*S. ater*) Common chuckwalla	Rocky outcrops in desert shrubland; throughout deserts of Calif., S Nevada, W Ariz., and Baja Calif.	warm seasons	Fed: none BLM: NECO Calif: S4	Low; no suitable bedrock outcrops
Uma scoparia Mojave fringe toed lizard	Sand, especially dunes, sandy hummocks, washes, stabilized sand flats; below sea level to about 3000 ft. elev.; Death Valley, SW to Antelope Valley and SE to W Arizona	Warm season	Fed: none BLM: Sensitive, NECO Calif: SSC S3S4	Occurs in aeolian sand; low on remainder of alignment (see text)
Charina trivirgata (Lichanura trivirgata) Rosy boa	Rocky chaparral and desert shrubland; gen below about 4500 ft. elev.; S Calif. through Baja Calif., SW Arizona, and western Sonora	Spring - summer	Fed: none BLM: NECO Calif: S3S4	Low-moderate (marginally suitable habitat throughout)
BIRDS				
Circus cyaneus Northern harrier	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Foraging: Expected rarely, mainly winter
Aquila chrysaetos Golden eagle	Nests in remote trees and cliffs; forages over shrublands and grass-lands; breeds throughout W N America, winters to E coast	Year-around	Fed: Eagle Protection act (see text) BLM: NECO Calif: SSC S3 fully protected	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
Pandion haliaetus Osprey	Nests in northern N America and Mexican coastlines near large water bodies, preys primarily on fish; winters in central Calif to S America;	Spring and fall migr. seasons	Fed: none BLM: none Calif: S3, watch list (nesting)	Nesting: Minimal (outside range; no suitable sites) Migration: Occurs, occasional flyover

Special-Status Wildlife Species	Habitat and Distribution	Activity Season	Conservation Status	Occurrence Probability
Buteo swainsonii Swainson's hawk	Breeds in trees in open habitats (e.g., grassland), Central Valley and W Mojave Des (Calif.) and east to cent. US, S. Canada, N. Mexico; winters in S America.	Spring and fall migr. seasons	Fed: none BLM: none Calif: S2, **THR**	Nesting: Minimal (outside range; no suitable sites) Migration: Occurs, occasional flyover
Buteo regalis Ferruginous hawk	Forages over grassland and shrub-land; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: none BLM: NECO Calif: SSC S3S4 (wintering)	Nesting: Minimal (outside range) Winter: Expected (rarely)
Accipiter striatus Sharp-shinned hawk	Nests and hunts in forest & woodland mainly to N (may breed in S Calif. Mtn woodlands); also forages in open areas; regularly winters in S Calif.	Winter	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat, outside range) Winter/Migration: Occurs (Jan 2011)
Accipiter cooperii Cooper's hawk	Nests and hunts in forest &woodland, also forages in open areas; most of US, Central and S America	Year-around	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Winter/Migration: Expected
Falco columbaris Merlin	Uncommon in winter in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none BLM: none Calif: SSC S3 (wintering)	Nesting: Minimal (outside range) Winter: Expected
Falco mexicanus Prairie falcon	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none BLM: NECO Calif: S3 (nesting)	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: Occurs (May 2012)
Athene cunicularia (*Speotyto cunicularia*) Burrowing owl	Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S Calif.; occurs through W US and Mexico	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S2 (burrow sites)	High; suitable habitat throughout (see text)
Asio flammeus Short-eared owl	Breeds in marshes and densely vegetated wetlands, forages over open wetlands, ag fields, and grasslands; temperate N & S America, Eurasia	Year-around	Fed: none BLM: none Calif: S3, SSC (nesting)	Breeding: Minimal (no habitat) Winter: Minimal (but reported near Lake Tamarisk)
Asio otus Long-eared owl	Breed in riparian woodlands; forage (nocturnally) over open land; sea level to about 6000 ft. elev.; through N America and Eurasia	Year-around	Fed: none BLM: none Calif: S3 SSC (nesting)	Breeding: Minimal (no habitat) Winter: Minimal (but occurs rarely at Lake Tamarisk

Special-Status Wildlife Species	Habitat and Distribution	Activity Season	Conservation Status	Occurrence Probability
Chaetura vauxi Vaux's swift	Breeds central Calif. and northward, in coastal and montane forests; winters in Central and S America	Spring and fall migr. seasons	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (outside range) Migration: Occurs, occasional flyover
Melanerpes uropygialis Gila woodpecker	Saguaro woodlands, sometimes other woodlands; cavity nester mainly in cactus; SE Calif., S Ariz, W Mexico (incl. Baja)	Year - around	Fed: none BLM: Sensitive Calif: **END** S1S2	Nesting: Low in palo verde - ironwood woodlands (see text)
Lanius ludovicianus Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.	Year-around	Fed: none BLM: none Calif: SSC S4 (nesting)	Occurs (suitable habitat throughout)
Aphelocoma californica cana Scrub jay (Eagle Mtn population)	Locally endemic year-around resident in pinyon woodlands in the Eagle Mountains; long-disjunct from other populations	Year-around	Fed: none BLM: none Calif: CDFG watch list, S1S2	High (observed nearby as transient, Oct 2011; see text)
Polioptila melanura Black-tailed gnatcatcher	Desert shrublands, gen. nests in shrub thickets along washes; occas. in open scrub (esp. in winter); Calif. deserts, to W Texas, Baja, and central Mexico	Year-around	Fed: none Calif: S4	Occurs (April 2011)
Toxostoma bendirei Bendire's thrasher	Joshua tree woodland, desert scrub; high cactus cover; mainly E Mojave Des in Calif. (scarce in W Mojave); American SW and mainl. Mexico; winters in S Arizona, New Mexico, and mainl. Mexico	Spring-summer	Fed: none BLM: Sensitive, NECO Calif: SSC S3	Low-Moderate; marginal habitat throughout
Toxostoma crissale Crissal thrasher	Nests in dense, low, brushy thickets of mesquite or other desert riparian shrubs; Sonoran Des, E Mojave Des, to Texas, W mainland Mexico	Year - around	Fed: none BLM: NECO Calif: SSC S3	Low-moderate; habitat marginally suitable
Toxostoma lecontei LeConte's thrasher	Calif. deserts, SW Central Val. & Owens Val., east to Utah, Arizona; open shrubland, often sandy or alkaline flats	Year - around	Fed: none BLM: NECO Calif: S3 (SSC in San Joaquin Val)	High; suitable habitat throughout
Pyrocephalus rubinus Vermillion flycatcher	Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico	spring - summer	Fed: none Calif: SSC S2S3 (nesting)	Nesting: Moderate (suitable nesting habitat in ironwood stands)

Special-Status Wildlife Species	Habitat and Distribution	Activity Season	Conservation Status	Occurrence Probability
Vermivora luciae Lucy's warbler	Cavity-nesting species; breeds in desert riparian woodlands through much of Arizona; winters on Pacific Coast of mainl. Mexico	spring - summer	Fed: none BLM: Sensitive Calif: SSC S2S3 (nesting)	Nesting: Moderate (margin of known range; see text) Migration: Occurs in area (April 2011)
MAMMALS				
Antrozous pallidus Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif, SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: none BLM: Sensitive Calif: SSC S3	Roosting: low Foraging: high
Corynorhinus (*Plecotus*) *townsendii* Townsend's big-eared bat (incl. "pale," "western," and other subspecies)	Many habitats throughout Calif and W N Amer, scattered populations in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: none BLM: Sensitive Calif: SSC, S2S3	Roosting: low Foraging: high
Euderma maculatum Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Not known	Fed: none BLM: Sensitive Calif: SSC S2S3	Roosting: low Foraging: low
Eumops perotis californicus California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S3?	Roosting: low Foraging: high
Lasiurus xanthinus (*Nycteris ega xanthina*) Western (Southern) yellow bat	Mexico and Cent. Amer., to S AZ; Riv., Imperial and San Diego Cos.; riparian and wash habitats; roosts in trees; evidently migrates from Calif. during winter	Spring-summer ?	Fed: none BLM: none Calif: S3	Roosting: low Foraging: high
Macrotus californicus (*M. waterhousii*) California leaf-nosed bat	Arid lowlands, S Calif., S and W Ariz., Baja Calif. and Sonora, Mexico; roost in mineshafts, forage over open shrublands	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S2S3	Roosting: low Foraging: high
Nyctinomops macrotis (*Tadarida molossa*) Big free-tailed bat	Roosts in crevices of rocky cliffs, scattered localities in W N. Amer. through Cent. Amer.; ranges widely from roost sites; often forages over water	Year-around (?)	Fed: none BLM: none Calif: SSC S2	Roosting: low Foraging: high
Nyctinomops femorosaccus (*Tadarida femorosaccus*) Pocketed free-tailed bat	Deserts and arid lowlands, SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs; forage over water and open shrubland	Year-around	Fed: none BLM: NECO Calif: SSC S2S3	Roosting: low Foraging: high
Xerospermophilus tereticaudus chlorus (*Spermophilus t. c.*) Palm Springs round- tailed ground squirrel (or Coachella Valley round-tailed ground squirrel)	Widespread in California deserts, Coachella Valley to Death Valley; formerly considered endemic to mesquite and sandy habitats in Coachella Valley	Year - around	Fed: none (former candidate) BLM: Sensitive Calif: SSC S2S3	High; reported in area (BLM 2011a)

Special-Status Wildlife Species	Habitat and Distribution	Activity Season	Conservation Status	Occurrence Probability
Neotoma albigula venusta Colorado Valley woodrat	Desert shrublands; SE Calif., SW Ariz., adj. Mexico, and southernmost Nevada; closely associated with beavertail or mesquite thickets	Year-around	Fed: none BLM: NECO Calif: S1S2	Low (habitat marginal)
Taxidea taxus American badger	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer	Year-around	Fed: none BLM: none Calif: CSC S4	High; expected in low numbers throughout area
Vulpes macrotia arsipus Desert kit fox	Widespread, open desert lands; constructs below-ground dens; requires soil suitable for burrowing; primarily nocturnal; preys on small mammals	Year-around	Federal: none BLM: none State: Calif. Code of Regs. Title 14 § 460	Occurs; numerous burrows on-site
Felis concolor browni Yuma mountain lion	Low desert, JTNP, to Colorado River; primarily in dense riparian habitats of river and dense desert wash scrub of canyons, where water and prey are available	Year-around	Fed: none BLM: NECO Calif: SSC	Expected in low numbers throughout area
Odocoileus hemionus eremicus (*O. h. crooki*) Desert mule deer, burro deer	Colorado desert, scattered mountains and bajadas, gen. near dependable water sources	Year-around	Federal: none BLM: NECO State: none	Expected in low numbers throughout area
Ovis canadensis nelsoni Nelson's bighorn sheep	Open shrublands and conifer forest, remote mountains; scattered populations in desert mountains and surrounding ranges, incl. Transverse and Peninsular ranges	Year - around	Fed: none BLM: Sensitive, NECO Calif: S3, FP (selected populations)	Expected in low numbers, mainly to move among mountain ranges
General References: American Ornithologists Union 1998 (including supplements through 2011); Barbour and Davis 1969; Calif. Dept. of Fish & Game 2011, 2012a; Feldhammer et al. 2003; Garrett and Dunn 1981; Grinnell and Miller 1944; Hall 1981; Jennings and Hayes 1994; Rosenberg, et al. 1991; Schuford and Gardali 2008; Stebbins 2003; USFWS 2011d; Wilson and Ruff 1999. Conservation Status and Occurrence Probability defined above (Table 3).				

Field surveys for special-status wildlife were conducted concurrently with the special-status plants and other wildlife surveys (Table 2).

Focused surveys for desert tortoise were conducted over 100 percent of the alignment, in accordance with USFWS survey protocol (2010a). Belt transects, spaced 10 m apart, were systematically walked over the length of the alignment. When observed, any potential desert tortoise sign (e.g., burrow) was documented on survey forms, photographed, and mapped using handheld GPS equipment. Where present, desert woodrat (*Neotoma lepida*) middens and animal burrows of various kinds (e.g., desert kit fox, coyote, badger, ground squirrel, kangaroo rat) were carefully inspected for presence of desert tortoises or their sign. In addition to desert tortoise burrows, any potential burrowing owl or desert kit fox burrows were mapped with hand-held GPS equipment. General weather conditions were recorded at the start and end of each survey. Temperatures and time of day were recorded at the start and end of each transect.

Phase II (burrow surveys) for burrowing owls were conducted concurrently with desert tortoise surveys, consistent with California Burrowing Owl Consortium guidelines (1993). Each burrow encountered during the desert tortoise survey was examined for sign of desert tortoise activity, as well as burrowing owl activity.

Robert Black evaluated habitat suitability for Mojave fringe-toed lizard on 25 June 2012.

Aspen biologists evaluated suitability for seasonal Couch's spadefoot breeding habitat on the alignment, based on soils and topography observed during vegetation mapping and streambed delineation field work, described in Section 3.3.

Results and Discussion

Listed Threatened or Endangered Plants

This section describes plant species reported from the region that are listed as threatened or endangered under the federal ESA or CESA. One listed threatened or endangered plant, Coachella Valley milk-vetch, has been reported in the Chuckwalla Valley, though that report is now discounted (see below). Other listed threatened or endangered species of the low desert region (e.g., triple-ribbed milk-vetch, Peirson's milk-vetch) occur well outside the area and are not addressed in this report. No listed threatened or endangered plant species, or species proposed for listing, or candidate for listing, has been documented from the alignment or surrounding area.

Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*): Coachella Valley milk-vetch is an annual or short-lived perennial endemic to the Coachella Valley. It is federally listed as endangered, a BLM sensitive species, and ranked as CRPR 1B. It is primarily found on loose aeolian (wind transported) sand or, less-often, in alluvial (water transported) sand, on dunes or flats and along disturbed margins of sandy washes. The easternmost known occurrences are near Indio, about 45 miles west of the Desert Harvest project area. All designated critical habitat for Coachella Valley milk-vetch is within the Coachella Valley, west of Indio (USFWS 2011a). Specimens resembling Coachella Valley milk-vetch have been collected from the Pinto Wash and Palen dune system, northeast of Desert Center. Similar specimens were collected by the Aspen field survey team on gen-tie alignment Alternative E during the field surveys described here. However, the USFWS (2009; 2011a) regards these as the related variety, speckled milk-vetch (*A. lentiginosus* var. *variabilis*), which has no special conservation status.

Gen-tie E occurrence or effects: The only portion of the alignment offering suitable habitat for Coachella Valley milk-vetch is the dunes and partially stabilized aeolian sand habitat over part of its length. However, since the project area and vicinity are well outside the recognized geographic range, no project impacts to Coachella Valley milk-vetch would be expected.

BLM Sensitive Plants

The BLM (2010a) maintains a list of Sensitive Species, including species that are rare, declining, or dependent on specialized habitats. The list includes all plants ranked by CNPS and CDFG as CRPR 1B. The BLM manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing). None of these species has been documented from the project site or gen-tie alternative alignments. Each BLM sensitive plant species known from the project vicinity is described briefly, below.

Chaparral sand verbena (*Abronia villosa* var. *aurita*): Chaparral sand-verbena's distribution and identification are unclear in published reference works, including Spellenberg (2002), CNPS (2012) and CNDDB (CDFG 2012a). It is a BLM sensitive species, and ranked as CRPR 1B. This plant was added to the CNPS Inventory based on recommendations by Andrew C. Sanders of the UC Riverside Herbarium. The primary conservation concern is for chaparral sand-verbena occurrences in western Riverside County and other locations outside the desert (see Roberts et al. 2004). These western plants appear to be distinct from the very common desert sand verbena, *Abronia villosa* var. *villosa*. Plants in the low desert often match the characteristics of the western Riverside County populations, but they are not regionally rare.

Gen-tie E occurrence or effects: There is a high probability that chaparral sand verbena could be found in sandy areas, particularly dunes and partially stabilized aeolian sand, along the alignment. It also could occur, with lower probability, along road or wash margins. If it occurs on the alignment, then gen-tie construction could impact individual plants, depending on the specific locations of project work areas and the plants themselves. Temporary construction disturbance probably would not cause long-term habitat degradation to dunes or partially stabilized sand fields. Instead, habitat suitability for chaparral sand verbena on temporary construction sites would be expected to recover after the conclusion of construction. Habitat also may recover on roads and road margins across sand habitats, vehicle traffic is very high. Chaparral sand verbena seeds would likely disperse into recovered habitat in later years, and long-term impacts to its local population (if any) would be relatively minor.

Harwood's woolly-star (*Eriastrum harwoodii*): Harwood's woolly-star is an annual species found in dunes and partially stabilized aeolian sand habitats in the deserts of eastern Riverside and San Bernardino counties (Gowen 2008) and San Diego County (DeGroot 2008). It is a BLM sensitive species, and ranked as CRPR 1B. It flowers in early April.

Gen-tie E occurrence or effects: Harwood's woolly-star was documented at numerous locations along portions of the alignment crossing dunes and partially stabilized sand (Figure 4). Because it is an annual plant, the specific sites where it was mapped in 2012 do not reflect long-term locations. In future years, Harwood's woolly-star plants could be found anywhere within the dunes or partially stabilized sand portions of the alignment. Gen-tie construction would likely impact individual plants, depending on the specific locations of project work areas and the plants themselves. Temporary construction disturbance probably would not cause long-term habitat degradation to dunes or partially stabilized sand fields. Instead, habitat suitability on temporary construction sites would be expected to recover after the conclusion of construction. Habitat also may recover on roads and road margins across sand habitats, vehicle traffic is very high. Harwood's woolly-star seeds would likely disperse into recovered habitat in later years, and long-term impacts to its local population would be relatively minor.

Orocopia sage (*Salvia greatae*): Orocopia sage is a shrubby sage with spiny leaves and lavender flowers. It is a BLM sensitive species, and ranked as CRPR 1B. It is endemic to the Orocopia and Chocolate mountains, Riverside County, where it occurs in desert washes below about 2800 feet elevation. It also has been reported from the Mojave Desert in San Bernardino County, thought that report almost certainly refers to a misidentification of Death Valley sage (*S. funerea*) (A. Sanders, UC Riverside, pers. comm.).

Gen-tie E occurrence or effects: Habitat on the alignment appears to be suitable, but it is a few miles north of its known geographic range. It has not been located on the alignment or other DHSP project areas during field surveys, but there is a low probability that it may occur on the alignment.

Mesquite neststraw (*Stylocline sonorensis*): Mesquite neststraw is known from southeastern Arizona and northeastern Sonora, Mexico. It has only been documented at one California location, near Hayfields Dry Lake, where it was collected in the 1930s. It is now presumed extirpated in California. It is ranked as CRPR 1A. Its habitat is reported as "grassy hillsides, sandy drainages, with mesquite" (Morefield 2006).

Gen-tie E occurrence or effects: The only potential habitat along the alignment is on drainage channels of the valley floor. Mesquite nest-straw was not located during field surveys and it is not expected to occur in the project area due to its apparent extirpation in California.

Other Special-Status Plants

In addition to the statutes and policies described above, several public agencies and private entities maintain lists of plants and animals of conservation concern. The CDFG compiles these in its compendia of "Special Plants" (CDFG 2012b). These plants are treated here as "special-status species." All plants of the region that are included in CDFG and CNPS rankings as CRPR 2, 3, or 4 are included in Table 3, but only those species reported from the site are addressed below.

Emory's crucifixion thorn (*Castela emoryi*): Emory's crucifixion thorn is endemic to the Sonoran and southern Mojave Deserts of the American southwest. It is widely scattered in southwestern Arizona; its scattered occurrences in the California deserts are the western extent of its range (Turner et al. 1995). The most well known stand is at the Crucifixion Thorn Natural Area (CTNA) in Imperial County, California. It also occurs at a few sites in northwestern Sonora, Mexico, and in northern Baja California immediately adjacent to the CTNA. Emory's crucifixion thorn is a leafless shrub or small tree of washes, non-saline dry lakes, and other sites where water accumulates. The plants are long-lived and densely thorny. The stems are light gray-green, rigid, ascending (directed upward) with stout spine-tipped twigs. Its flowers are inconspicuous and abundant. The fruits, after maturing, remain on the plant for several years. Young plants, prior to fruiting, do not have the characteristic clustered fruits of older plants. Plants occur as scattered colonies, possibly clones, of fairly small size that do not extend far across the landscape (Shreve and Wiggins 1964). Emory's crucifixion thorn is assigned to CRPR 2.3 (rare, threatened, or endangered in California, but more common elsewhere). It is not managed by BLM as a sensitive species (BLM 2010a).

Gen-tie E occurrence or effects: One crucifixion thorn plant was located near the alignment (Figure 4), but none were located on the alignment itself. Crucifixion thorn is a large, conspicuous shrub, and it is unlikely that any additional plants may have been missed during field surveys. Construction of gen-tie Alternative E would be unlikely to affect crucifixion thorn.

Desert unicorn-plant (*Proboscidea althaefolia*): Desert unicorn-plant, also called "devil's claw," is a perennial herb that grows from a large rooststock. It is dormant in spring, but sprouts in response to summer rains. It ranges throughout much of the Sonoran Desert, eastward to Texas and parts of mainland Mexico. It is conspicuous for its woody, hook-shaped fruits (pods), that are evidently dispersed by clinging to fur or hooves of large mammals. It is ranked as CRPR 4.3 (limited distribution, "watch list"). It is not managed by BLM as a sensitive species (BLM 2010a).

Gen-tie E occurrence or effects: Desert unicorn-plant was located at several sites on the alignment during fall 2011 (Figure 3). Gen-tie construction would be expected to impact an unknown number of plants, depending on the specific locations of project work areas and the plants themselves. In some cases, depending on the specific nature of construction activities, these plants may recover by re-sprouting from rootstocks. But in most cases, plants subject to significant soil disturbance or compaction would not be expected to recover.

Ribbed cryptantha (*Cryptantha costata*): Ribbed cryptantha is an annual species found on windblown and stabilized sands, in the eastern Mojave and Sonoran Deserts in California, eastward into Arizona and south into Baja California. It flowers in spring. It is ranked as CRPR 4.3 (limited distribution, "watch list"). It is not managed by BLM as a sensitive species (BLM 2010a).

Gen-tie E occurrence or effects: Ribbed cryptantha occurs throughout the dune habitat along the alignment (Figure 4). Because it is an annual plant, the specific sites where it was mapped in 2012 do not reflect long-term locations. In future years, it could be found anywhere within the dunes or partially stabilized sand portions of the alignment. Gen-tie construction would likely impact individual plants, depending on the specific locations of work areas and the plants themselves. Temporary construction disturbance probably would not cause long-term habitat degradation to dunes or partially stabilized sand fields. Instead, habitat suitability on temporary construction sites would be expected to recover after the conclusion of construction. Habitat also may recover on roads and road margins across sand habitats, vehicle traffic is very high. Ribbed cryptantha seeds would likely disperse into recovered habitat in later years, and long-term impacts to its local population would be relatively minor.

Listed Threatened or Endangered Wildlife

This section includes species listed as threatened or endangered under CESA or ESA. One listed threatened or endangered species, the desert tortoise, occurs throughout the upper Chuckwalla Valley near the alignment. Two others (Gila woodpecker and Swainson's hawk) have been observed near the alignment during migratory or wintering seasons, but are not expected to use the alignment for breeding. Other listed species of the region are either limited to riparian and aquatic habitats (e.g., southwestern willow flycatcher, least Bell's vireo, and desert pupfish) or occur well outside the area (e.g., Coachella Valley fringe-toed lizard).

Desert Tortoise (*Gopherus agassizii*): The desert tortoise is listed as threatened under CESA, and the Mojave population (i.e., west of the Colorado River) is listed as threatened under the federal ESA. Natural history, conservation status, and threats to the desert tortoise are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), summarized in Table 4, and are not repeated here. Designated critical habitat and a Revised Recovery Plan for the desert tortoise have been published by USFWS (1994; 2011c).

Gen-tie E occurrence or effects: Portions of the gen-tie alignment Alternative E are within designated critical habitat for the desert tortoise, the Chuckwalla Critical Habitat Unit, west of Kaiser Road and near the I-10 Freeway (see Figure 3). The USFWS (2011c) identifies five recovery units for the desert tortoise based largely on geographic discontinuities or barriers that coincide with observed variation among tortoise populations. All DHSP components including the alignment are located in the Colorado Desert Recovery Unit.

The nearest documented desert tortoise locations are on the Desert Sunlight project site, about 0.3 mile north of the DHSP site; on DHSP gen-tie alignment Alternatives B, C, and D; and at the Red Bluff Substation location (BLM 2011a; Ironwood Consulting 2010). In addition, a road-killed desert tortoise was observed at the Eagle Mountain off ramp on east-bound Interstate 10 approximately 7.5 miles southwest of the site (AMEC 2011a).

No live desert tortoises or recent sign were observed on the alignment or adjacent areas during the field surveys. However, several desert tortoise burrows, designated as class 3 (deteriorated condition) were located on the alignment. None of the burrows exhibited any evidence of recent use or corroborating sign.

The occurrence of tortoise sign, even where no living tortoises are found during surveys, indicates desert tortoise presence (USFWS 2010a). Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of active desert tortoises on the adjacent project site and gen-tie alignments, we conclude that the alignment may be occupied by desert tortoises at any time, albeit only in low numbers. Project development would eliminate about 85 acres of habitat along the access road and at work sites, and could kill or injure desert tortoises. Project development will necessitate consultation between the BLM and USFWS per Section 7 of the ESA, and permitting from CDFG under Section 2080.1 or 2081 of the California Fish and Game Code.

Gila woodpecker (*Melanerpes uropygialis*): The Gila woodpecker is listed as endangered under CESA but has no status under the federal ESA. It is a bird species of conservation concern (USFWS 2008). Its geographic range, natural history, and conservation are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), summarized in Table 4, and are not repeated here.

Gen-tie E occurrence or effects: A Gila woodpecker was observed in the southeastern part of the DHSP solar facility site in December 2010, but was not seen again during the BLM protocol winter season or breeding season avian point counts (AMEC 2011b) or during follow-up focused breeding season surveys in 2012 (AMEC, in prep.).

The Desert Harvest site, including gen-tie alignment Alternative E is about 40 miles west of the Gila woodpecker's published geographic range (McCreedy 2008), but unpublished observations have been reported from Corn Springs, about 11 miles south of the site and about five miles south of the southern end of the gen-tie alignments (C. McGaugh, AMEC, pers. obs.). There is a native palm grove at Corn Springs, and Gila woodpeckers may nest in the palm trees. Also, a Gila Woodpecker was reported on September 28, 2010 during field surveys for the Desert Sunlight project (AMEC 2011b). It is possible that the Corn Springs and Desert Center areas support a small Gila woodpecker population, or that the two local observations in late 2010 were chance observations of an itinerant individual.

Desert wash woodlands on the alignment may provide suitable nesting and foraging habitat for Gila woodpecker. The woodlands are dominated by desert ironwood trees, which apparently are too dense for next excavation (McCreedy 2008), and most of the blue palo verdes are too small for cavity nests. However, scattered larger blue palo verde trees are present in low numbers throughout the woodlands, and could serve as suitable nest trees.

Gen-tie construction would eliminate about 60 acres of potential nesting and foraging habitat for Gila woodpecker. Habitat impacts on the gen-tie alignments would generally be limited to road construction, small areas around the transmission line structures, and increased human disturbance during construction, operations/maintenance, and decommissioning project phases.

In addition to habitat impacts, the project could cause mortality or injury to a Gila woodpecker (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below. As a state-listed species, any take of Gila woodpecker would necessitate CESA permitting under § 2081 of the California Fish and Game Code. Avoidance of take, as defined by the Fish and Game Code, could be achieved by implementing measures to avoid all nesting birds (see Native Birds: Migratory Bird Treaty Act / California Fish and Game Code, below), as recommended in Mitigation Measure WIL-3 of the DEIS.

Swainson's hawk (*Buteo swainsoni*): The Swainson's hawk is listed as a threatened species under CESA but has no federal listing status. It is a migratory raptor. It breeds in open plains and prairies in the Great Plains and relatively arid areas of western North America, including the Central Valley and the western Mojave Desert in California. It winters in South America, primarily in Argentina. During the spring and fall migration seasons, Swainson's hawks are observed regularly in southern California.

Gen-tie E occurrence or effects: A Swainson's hawk was observed flying over the Desert Harvest project site during April 2011 (AMEC 2011b). The upper Chuckwalla Valley, including the alignment, may serve as incidental foraging habitat during migratory seasons, but otherwise would not support Swainson's hawks, due to the distance from its breeding range. Project development would not affect nesting habitat and has little likelihood of adversely affecting Swainson's hawk.

Species Protected Under the Federal Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d; BGEPA) prohibits take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). The BGEPA defines *take* to include "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing." The USFWS (2007) further defines *disturb* as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Golden Eagle (*Aquila chrysaetos*): Golden eagle natural history, threats, and conservation status are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), summarized in Table 4, and are not repeated here. In addition to its federal status under the BGEPA, the golden eagle is designated by the California Fish and Game Code as a fully protected species and by BLM as a sensitive species (below).

Gen-tie E occurrence or effects: The mountain ranges surrounding the upper Chuckwalla Valley provide suitable golden eagle nesting and foraging habitat, and the valley floor is suitable as foraging habitat. Inactive golden eagle nests have been documented to the northwest, northeast, and south of the Desert Harvest site. One active but non-reproductive nest was reported during 2010 in the Coxcomb Mountains, about 5 miles northeast of the site (BLM 2011a). Nest activity, but no reproduction, also was reported at one site in 2012 (pers. comm., Dr. L.F. LaPre, Wildlife Biologist, BLM California Desert District). Golden eagle nests or territories that are inactive in a given year may be used in future years. Therefore, unoccupied nests or territories are considered potentially active in future years.

The gen-tie line alignment is on the Chuckwalla Valley floor, and does not provide suitable golden eagle nesting habitat. No on-site impacts to nest sites are expected, but golden eagles are sensitive to human disturbances during the nesting season. If there is an active nest nearby, then human activity and noise during project construction could adversely affect golden eagle nesting success.

The alignment provides suitable foraging habitat and golden eagles could forage there at any time of year. Foraging golden eagles could include mated pairs using the surrounding nesting territories. Or if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed could forage over the site during breeding season. Foraging would probably be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges. During a series of focused winter surveys in 2011-12, one golden eagle was observed within the 10-mile radius surrounding the DHSP project area (Bloom Biological 2012; Appendix C.7 of the DEIS).

If the project would take golden eagles, as defined by the BGEPA and USFWS (2007), above, then consultation with the USFWS would be required. The USFWS recommends evaluating potential impacts to nesting and foraging golden eagles by evaluating eagle use of the area and inventorying golden eagle territories if suitable nesting, roosting, and foraging habitat are present on a proposed project site or within a 10-mile radius of the site (Pagel et al. 2010).

Gen-tie construction would eliminate about 85 acres of potential foraging habitat for golden eagles. Habitat impacts on the gen-tie alignments would generally be limited to road construction, small areas around the transmission line structures, and increased human disturbance during construction, operations/maintenance, and decommissioning project phases. The gen-tie line also could pose a collision or electrocution hazard to golden eagles, as described in Section 4.4 of the DEIS. However, these risks would be mitigated or minimized through Mitigation Measures WIL-3, WIL-5 and WIL-6 as recommended in the DEIS; implementation of the Bird and Bat Conservation Strategy (Appendix C.9 of the DEIS). Based on the location and nature of the project, and on baseline information on golden eagle occurrence in the upper Chuckwalla Valley, enXco does not anticipate that the gen-tie line would take golden eagles.

Wildlife Species Fully Protected Under the California Fish and Game Code

Under the state Fish and Game Code, selected fish and wildlife species are designated as fully protected, prohibiting take except under permit for scientific purposes. Most of the designated fully protected species occur well outside the project vicinity, but several could occur in the area. These are: golden eagle (discussed above, Species Protected under the Bald and Golden Eagle Protection Act), selected populations of Nelson's bighorn sheep (discussed below, BLM Sensitive Wildlife Species), American peregrine falcon, and ring-tailed cat.

Desert kit fox is not specifically designated as fully protected. However, take is prohibited under Title 14 Section 460 of the California Code of Regulations. Thus, its legal status is similar to designated fully protected species, above.

American peregrine falcon (*Falco peregrinus*): Peregrine falcons were formerly listed under CESA and ESA, but have been delisted under both Acts. They are found irregularly in the region, generally during migratory and winter seasons. They have not been known to nest in the region in recent decades, though they did nest in desert mountain ranges near the Colorado River historically (Rosenberg et al. 1991; Patten et al. 2003). They feed primarily on birds captured during flight. Waterfowl and shorebirds make up a large proportion of their prey, and nest sites are often within foraging range of large water bodies.

Gen-tie E occurrence or effects: Project implementation would not affect nesting habitat and has little likelihood of adversely affecting foraging behavior.

Ring-tailed cat (*Bassariscus astutus*): The ring-tailed cat, or ringtail (it is unrelated to true cats), occurs throughout much of California and southwestern North America, in many habitat types, including forests, woodlands, and deserts. In deserts, it generally is found in steep or rocky terrain, and uses rock piles and bedrock crevices for shelter. It also dens in burrows, tree cavities, or brush piles (Wilson and Ruff 1999).

Gen-tie E occurrence or effects: Habitat in the regional mountain ranges is suitable for ringtail, though habitat on the project site appears to be poorly suitable due to lack of suitable den sites and relatively low cover or shelter availability. The project is unlikely to cause take or other adverse impacts to ringtails.

Desert kit fox (*Vulpes macrotis arsipus*): Desert kit fox is not ranked as a special-status species by the State of California or the USFWS, but it is protected under Title 14, Section 460, California Code of Regulations, which prohibits take. This summary of kit fox biology is based on Cypher (2003). Kit foxes are primarily nocturnal, and inhabit open level areas with patchy shrubs. Friable soils are necessary for the construction of dens, which are used throughout the year for cover, thermoregulation, water conservation, and rearing pups. Their home ranges vary but average about 1,100 ha (2,700 acres) in California deserts. They are not strongly territorial and home ranges can overlap. Desert kit fox pairs and young may use one or several active den complexes. Pairs raise one litter of about four pups per year, born between late January and March. The pups emerge from the natal den four weeks after birth and begin to forage with the parents at age three to four months. In early 2012, an outbreak of canine distemper virus was discovered in desert kit fox populations in eastern Riverside County, including the immediate vicinity of the proposed DHSP site (M. Massar and M. Rodriguez, pers. comm. with Scott D. White, March 2012). The CDFG is currently assessing the extent of the outbreak and developing strategies for desert kit fox management to address the distemper outbreak and the habitat impacts of renewable energy projects.

Gen-tie E occurrence or effects: We identified 23 desert kit fox burrows or burrow complexes (dens with multiple openings at the surface) on the alignment, and suitable habitat occurs throughout the project study area. Project construction would eliminate about 85 acres of suitable habitat along the length of gen-tie alignment Alternative E. Depending on the specific locations of project components, construction also could destroy burrows. Take of desert kit foxes can be avoided through passive relocation measures, as recommended in Mitigation Measure WIL-7 of the DEIS.

BLM Sensitive Wildlife Species

The BLM maintains a list of Sensitive Wildlife Species, including species that are rare, declining, or dependent on specialized habitats (BLM 2010b). It manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing). In addition to species addressed in this section of the BRTR, all listed threatened or endangered species (above) are managed as BLM sensitive species.

Couch's spadefoot (*Scaphiopus couchi*): Couch's spadefoot natural history, threats, and conservation status are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), and summarized in Table 4.

Gen-tie E occurrence or effects: Topography and drainage channel morphology on the alignment indicate that no suitable breeding pools would form or hold rain water long enough for spadefoot reproduction. Upland habitat may be suitable as winter dormancy/burrowing habitat, depending upon the project site's proximity to breeding pools, the species' movement distances between borrow and breeding sites, and any specific habitat requirements for burrowing sites. Project development would not be expected to impact Couch's spadefoot breeding habitat and potential impacts to winter dormancy habitat appear to be minimal, based on lack of breeding pools in the area.

Banded Gila monster (*Heloderma suspectum cinctum*): The Gila monster is rare in California, and more common in Arizona and northwestern Mexico. It is a large and distinct lizard, but is difficult to observe even in areas where its occurrence is known. As a result, little is known about its distribution, population status, and life history in California. Most historical observations in California have been in riparian areas or at moderate elevations of the higher desert mountain ranges, in rocky, incised topography (Lovich and Beaman 2007). In California, the Gila monster is apparently confined to the eastern deserts (east of 116° longitude) where summer rainfall makes up 25 percent of average annual precipitation (Lovich and Beaman 2007). There has been only one report from farther west (the Mojave River). Throughout its range, the Gila monster appears to be most active during or following summer rains.

Gen-tie E occurrence or effects: The alignment may be west of the banded Gila monster's range, and habitat on the alignment appears to be only marginally suitable. Project development is unlikely to affect banded Gila monster.

Mojave fringe toed lizard (*Uma scoparia*): The Mojave fringe-toed lizard's natural history, threats, and conservation status are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), and summarized in Table 4. It is primarily found in fine, loose, aeolian (windblown) sand habitat but will also use other substrates surrounding aeolian sands. Sand dunes are its primary habitat, although it also uses sands and surrounding habitats at the margins of dry lakebeds, washes, and isolated blowsand pockets against hillsides (BLM and CDFG 2002), and mixed habitat such as hummocks or pockets of soft sand interspersed with hard-packed sand (Cablk and Heaton 2002). Aeolian sand habitat is vulnerable to direct and indirect disturbances (Weaver 1981; Beatley 1994; Barrows 1996). Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors will, in turn, affect Mojave fringe-toed lizard habitat and populations (Turner et al. 1984; Jennings and Hayes 1994). Dune habitat that is cut off from its sand source will degrade over time as finer sands are blown away, leaving behind smaller dunes composed of coarser-textured sand.

Gen-tie E occurrence or effects: The portion of the alignment that crosses dunes is occupied by Mojave fringe-toed lizards (Figure4, Figure 7). Development of the gen-tie line Alternative E would be likely to take habitat and possibly take individual lizards. The remainder of the alignment, on bajada and alluvial landforms, does not appear to provide suitable habitat. Ephemeral washes and channels on the bajada and alluvial surfaces provide patchy alluvial sand habitats but the sand was often cemented or compacted, and the sand depth and coarse texture were poorly suitable for Mojave fringe-toed lizard. In these landforms, the few isolated areas where deeper, loose sand was present were not large enough to support Mojave fringe-toed lizard.

Aeolian sand in this area is within a sand transport corridor, originating upslope in JTNP, and continuing southeast to the Palen Dunes. The gen-tie line, if built, would be unlikely to interrupt sand transport through the system due to the wide spacing between towers.

Burrowing owl (*Athene cunicularia*): The burrowing owl's natural history, threats, and conservation status are reviewed in the DHSP BRTR (Aspen and AMEC 2012) and DEIS (BLM 2012), and summarized in Table 4. It is a BLM Sensitive Species and a CDFG Species of Special Concern. As a native bird, it is also protected by the federal Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (below). In the California deserts, burrowing owls generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is 1 February through 31 August.

Gen-tie E occurrence or effects: No burrowing owls or their sign were observed on the 400-foot alignment during the field surveys described above. Incidental burrowing owl observations have been made on the DHSP site (Aspen and AMEC 2012) but no sign (e.g., whitewash, prey remains, or owl pellets) has been found on the solar facility site. Based on these field surveys and incidental observations, we conclude that the alignment is suitable habitat for burrowing owls during winter or breeding seasons. Breeding burrowing owls could nest on the site in future years. During fall and winter, the site appears to serve as low-density seasonal burrowing owl habitat. In the event that burrowing owls may occupy work sites on the alignment, avoidance of take, as defined by the Fish and Game Code, could be achieved by implementing measures to avoid all nesting birds (see Native Birds: Migratory Bird Treaty Act / California Fish and Game Code, below), as recommended in Mitigation Measures WIL-3 and WIL-4 of the DEIS.

Bendire's thrasher (*Toxostoma bendirei*): Bendire's thrasher is a BLM Sensitive Species and CDFG Species of Special Concern. It is also protected under the federal MBTA and California Fish and Game Code, described further below. California populations are migratory, though it is found year-around in more southern portions of its range, in southern Arizona and adjacent Mexico. The alignment is near the southern boundary of its breeding range in California. It breeds in open, upland desert shrublands of JTNP and surrounding area, and northward through several disjunct regions of the Mojave Desert (Sterling 2008). Its habitat requirements are poorly understood, but it is generally associated with *Yucca* (e.g., Joshua tree) and *Opuntia* (cholla cacti, also classified as *Cylindropuntia*) species on gently sloping terrain. Soil texture is apparently important to habitat suitability, perhaps because Bendire's thrashers largely forage on ground-dwelling insects. Hard rocky soils (e.g., desert pavement) and loose sands (e.g., dry wash sands) are apparently less suitable than firmly packed, fine-textured soils.

Gen-tie E occurrence or effects: Bendire's thrashers were not observed on the alignment during the field surveys. Habitat throughout the alignment appears to be of marginal suitability, due to relatively low cover of *Yucca* and *Opuntia* species, and seemingly poorly-suitable soil texture. There is a low to moderate probability that Bendire's thrasher may occur on the site.

Lucy's warbler (*Vermivora luciae*): Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. It is a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees), and also may nest in bark crevices of larger trees. Its primary nesting habitat is mesquite thickets, but also uses native riparian trees and saltcedar (*Tamarix* spp.).

Gen-tie E occurrence or effects: Lucy's warblers were observed at the DHSP solar facility site during April 2011 (AMEC 2011b), but were not observed later during the nesting season point counts (28 April survey date). It is unknown whether either or both of these birds successfully established breeding territories in the area, or moved on to another site. Suitable nesting sites may be available in large ironwood or blue palo verde trees on the alignment. Lucy's warblers may nest in desert wash woodlands on or near the alignment.

Project development would eliminate about 60 acres of potential nesting and foraging habitat. In addition to habitat impacts, the project could cause mortality or injury to a Lucy's warbler (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below. Avoidance of take, as defined by the Fish and Game Code, could be achieved by implementing measures to avoid all nesting birds (see Native Birds: Migratory Bird Treaty Act / California Fish and Game Code, below), as recommended in Mitigation Measure WIL-3 of the DEIS.

Nelson's bighorn sheep (*Ovis canadensis nelsoni*): Nelson's bighorn sheep are known from the Transverse Ranges, California Desert Ranges, Nevada, northern Arizona, and Utah. Its populations in the Peninsular Ranges (the Santa Rosa and San Jacinto Mountains, and southward into Baja California) are federally listed as a threatened distinct vertebrate population segment. However, populations in eastern Riverside County have no CESA or ESA listing status. It is a BLM Sensitive Species and, except where designated otherwise by CDFG, is fully protected under the state Fish and Game Code. Threats to Nelson's bighorn sheep include habitat loss or degradation; limited availability of water sources; barriers to local or regional movement (e.g., highways and aqueducts); disease spread by domestic livestock; and natural predation by mountain lions in some populations.

Gen-tie E occurrence or effects: Habitat in the desert mountain ranges surrounding the upper Chuckwalla Valley is occupied by Nelson's bighorn sheep, and they occasionally use the valley floor habitat. Ungulate tracks, from either Nelson's bighorn sheep or burro deer, were observed on the DHSP solar facility site during 2011 (Aspen and AMEC 2012). Project construction would not cause habitat degradation in the mountains, though construction could cause noise and human disturbance as described above for golden eagle nesting territories. Bighorn sheep tend to acclimate to these activities in areas where such disturbances occur routinely (e.g., quarries; Jansen et al. 2009). Due to the gen-tie alignment's location on the valley floor near sites with comparable land uses and human activity patterns, the project is not likely to affect bighorn sheep behavior or habitat use to any large extent.

Bats: The BLM includes several bat species on its list of sensitive species. Most of the special status bats of the local area roost in rock crevices, tunnels, or caves; one species (western yellow bat, *Lasiurus xanthinus*) roosts in the foliage of riparian trees. Roost sites may be used seasonally (e.g., inactive cool seasons) or daily (day roosts, used during inactive daylight hours). Maternity roosts are particularly important overall for bat life histories. Knowledge of bat distributions and occurrences is sparse. The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Pierson & Rainey 1998; Gannon 2003). Bat life histories vary widely. Some species hibernate during winter, or migrate south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. All special-status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands such as found on the project site.

Gen-tie E occurrence or effects: Gen-tie line construction is unlikely to affect special-status bat roost sites, but would eliminate about 85 acres of desert shrubland foraging habitat, including 60 acres of productive dry desert wash foraging habitat.

Palm Springs round-tailed ground-squirrel (*Xerospermophilus tereticaudus chlorus*): Palm Springs round-tailed ground squirrel (also called Coachella Valley round-tailed ground squirrel) is a California Species of Special Concern, on the BLM Sensitive Species list, and was a candidate for federal listing as threatened or endangered prior to 2010, when it was removed from the list of candidates (USFWS 2010b). Until recently, it was believed to be limited in range to the Coachella Valley region. Recent research indicates that its range is substantially larger than previously understood, extending at least 150 miles northward to Hinkley Valley and Death Valley. Based on this range extension; the protected habitat in Death Valley National Park; and ongoing conservation efforts in the Coachella Valley, the USFWS concludes that it no longer warrants candidate status. The expanded understanding of Palm Springs round-tailed ground-squirrel's geographic range also seems to indicate that it uses a broader range of habitat than previously understood.

Gen-tie E occurrence or effects: Palm Springs round-tailed ground squirrel occurs in the general area (BLM 2011a) and on the DHSP site (Aspen and AMEC 2012), but was not noted on the alignment during surveys summarized in this BRTR supplement. Palm Springs round-tailed ground squirrel appears to occur at low densities throughout the area. Gen-tie line construction would eliminate about 85 acres of suitable habitat and could take individual animals, if occupied burrows are located at construction sites. Mitigation measures described in the DEIS would offset or minimize these impacts.

Other Special-Status Wildlife Species

In addition to the statutes and policies described above, several public agencies and private entities maintain lists of wildlife species of conservation concern. The CDFG compiles these in its compendium of and "Special Animals." These species are treated here as "special-status species."

Rosy boa (*Charina trivirgata*): The rosy boa occurs in rocky shrublands from sea level to about 6700 feet elevation. In the coastal regions, it is found south and west of the major mountain chains, in the interior valleys and mountains of Los Angeles, Riverside, San Bernardino, and Orange counties, southward to the coast in San Diego County and Baja California. In the deserts, rosy boas range throughout most of the Mojave Desert and much of the Colorado Desert, eastward into Arizona. They are active during warm seasons, and are primarily nocturnal. The CDFG Natural Diversity Data Base considers rosy boa a "special animal" but it has no formal status under state or federal Endangered Species Acts.

Gen-tie E occurrence or effects: Habitat on the alignment may be marginally suitable for rosy boa, but lacks the boulders or rock crevices of their primary habitat. The alignment is within their geographic range and could be occupied at low density.

Raptors: In addition to raptors discussed above, several other special-status birds of prey are found seasonally, especially during winter, in the region. These include osprey (*Pandion haliaetus*), ferruginous hawk (*Buteo regalis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbaris*), short-eared owl (*Asio flammeus*), and long-eared owl (*A. otus*) (Table 4). Osprey and sharp-shinned hawk were observed flying over the solar facility site during winter season point count surveys, but neither species would nest in the area (AMEC 2011b). A prairie falcon was observed over the alignment during spring 2012. Outside their breeding seasons, these raptors need not return to their nests to feed young or tend eggs. Thus, they are able to forage over wide areas, where they capture birds or small mammals. Suitable winter or migratory season foraging habitat for all of these raptors is widely available throughout the region.

Gen-tie E occurrence or effects: Potential project impacts to these species and their foraging habitat would be comparable to those discussed above for wintering golden eagles. In summary, construction of the gen-tie alignment Alternative E would eliminate 85 acres of suitable foraging habitat, cause increased noise and disturbance to adjacent habitat, and may present collision or electrocution hazards.

Upland perching birds: Several upland perching bird species are included in the CDFG Special Animals compilation. These include loggerhead shrike (*Lanius ludovicianus*), Bendire's thrasher (*Toxostoma bendirei*) LeConte's thrasher (*T. lecontei*), Crissal thrasher (*T. crissale*), black-tailed gnatcatcher (*Polioptila melanura*), the Eagle Mountains scrub-jay population (*Aphelocoma californica cana*), and vermilion flycatcher (*Pyrocephalus rubinus*). In addition, a Vaux's swift (*Chaetura vauxi*) was observed over the site during migration season (AMEC 2011b); this species occurs in the area only during migration; it nests well to the north, and project development would be unlikely to affect Vaux's swift.

Gen-tie E occurrence or effects: Loggerhead shrikes were observed on the solar facility site throughout the winter and breeding season avian point count surveys (AMEC 2011b) and on the gen-tie alignment Alternative E during spring 2012. Black-tailed gnatcatcher was observed on gen-tie alignment Alternative E during spring 2012. Neither LeConte's thrasher nor Crissal thrasher have been reported on the alignment, but habitat is suitable and either species could occur there. Project development would eliminate 85 acres of suitable habitat for these species. Vermilion flycatchers have not been reported on-site, but nest in similar habitat to the south (AMEC 2011b) and could nest in ironwood woodlands on the alignment in future years. Project development would eliminate 60 acres of suitable desert woodland habitat. The Eagle Mountains scrub-jay population resides year-around in pinyon woodlands in the Eagle Mountains. It is disjunct from other scrub-jay populations, and is on CDFG's "watch list" but has no other special conservation status. A scrub-jay was observed on the DHSP solar facility site in October 2011; presumably, it was wandering or dispersing from habitat in the Eagle Mountains. However, this bird could have come from much farther away. Scrub-jays of the Great Basin population can wander considerable distances. However, no suitable scrub-jay habitat is found on the alignment. Other potential impacts to these species would be similar to those discussed under the MBTA (below).

Wide-ranging mammals: Several mammal species range widely through desert habitats, either among partially isolated mountain ranges (e.g., Nelson's bighorn sheep, above) or more often in valleys. These include Yuma mountain lion (*Felis concolor browni*), burro deer, or desert mule deer (*Odocoileus hemionus eremicus* [= *O. h. crooki*]), American badger (*Taxidea taxus*), and desert kit fox (discussed above, under fully protected species).

Gen-tie E occurrence or effects: Sign of American badger and desert kit fox, ungulate tracks from either Nelson's bighorn sheep or desert mule deer, were located on the solar facility site during field surveys for desert tortoise and other resources (Aspen and AMEC 2012). The project would eliminate approximately 85 acres of habitat that is suitable for each of these species, though used only rarely by Nelson's bighorn sheep, Yuma mountain lion, Nelson's bighorn sheep, or desert mule deer.

WILDLIFE MOVEMENT

Gen-tie line construction would minimally and temporarily affect wildlife movement at each work site. Wildlife would likely avoid the work areas during active construction. However, due to the intermittent locations of construction activity and its temporary nature, wildlife would not be physically prevented from moving around project equipment in the gen-tie corridor. Once construction is complete, the gen-tie would not pose an important barrier to wildlife movement due to the wide spacing between towers.

NATIVE BIRDS: MIGRATORY BIRD TREATY ACT / CALIFORNIA FISH AND GAME CODE

The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Sections 3503, 3503.5, and 3513 prohibit take of any migratory bird, including eggs or active nests, except as permitted by regulation (e.g., hunting waterfowl or upland game species). "Migratory bird" is broadly defined to apply to most native bird species. With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above.

The entire alignment and surrounding area provides suitable nesting habitat for numerous resident and migratory bird species. Many adult birds would flee from equipment during initial vegetation clearance for project construction. However, nestlings and eggs would be vulnerable during project construction. If initial site grading or brush removal were to occur during nesting season, then it likely would destroy bird nests, including eggs or nestling birds. For most birds, these impacts can be avoided by scheduling initial clearing and grading outside the nesting season. Or, if initial clearing and grading are undertaken during nesting season, work may be limited only to areas where no nesting birds are present, as documented by pre-construction nest surveys. One special-status species, the burrowing owl, is unlikely to flee the site during construction even outside the nesting season, due to its characteristic behavior of taking cover in burrows. Avoidance of burrowing owls during initial clearing and grading necessitates pre-construction surveys for active burrows, and follow-up measures to "passively relocate" the owls if they are present.

Some birds will likely nest in the project area during construction, even after initial grading and clearing. Depending on the species, birds may nest on open ground; within the open metal framework of the panel support structures; on buildings, foundations, structures, or construction trailers; or on idle vehicles or construction equipment left overnight or during a long weekend. In areas where construction is phased (e.g., footings or tower structures) birds may quickly use these features as nest sites. The species most likely to nest in the project area during construction are common ravens, house finches (*Carpodacus mexicanus*), and mourning doves (*Zenaida macroura*), all of which are protected by the MBTA and Fish and Game Code §§ 3503 and 3513. Due to the high probability that birds may nest on site during construction, regular monitoring is necessary throughout the breeding season. In some cases, it may be necessary to reduce buffer areas or to remove or relocate a bird nest in coordination with the resource agencies to proceed safely with construction.

Project impacts to migratory birds can be minimized through implementation of Mitigation Measures WIL-3, WIL-4, and WIL-6 as recommended in the DEIS.

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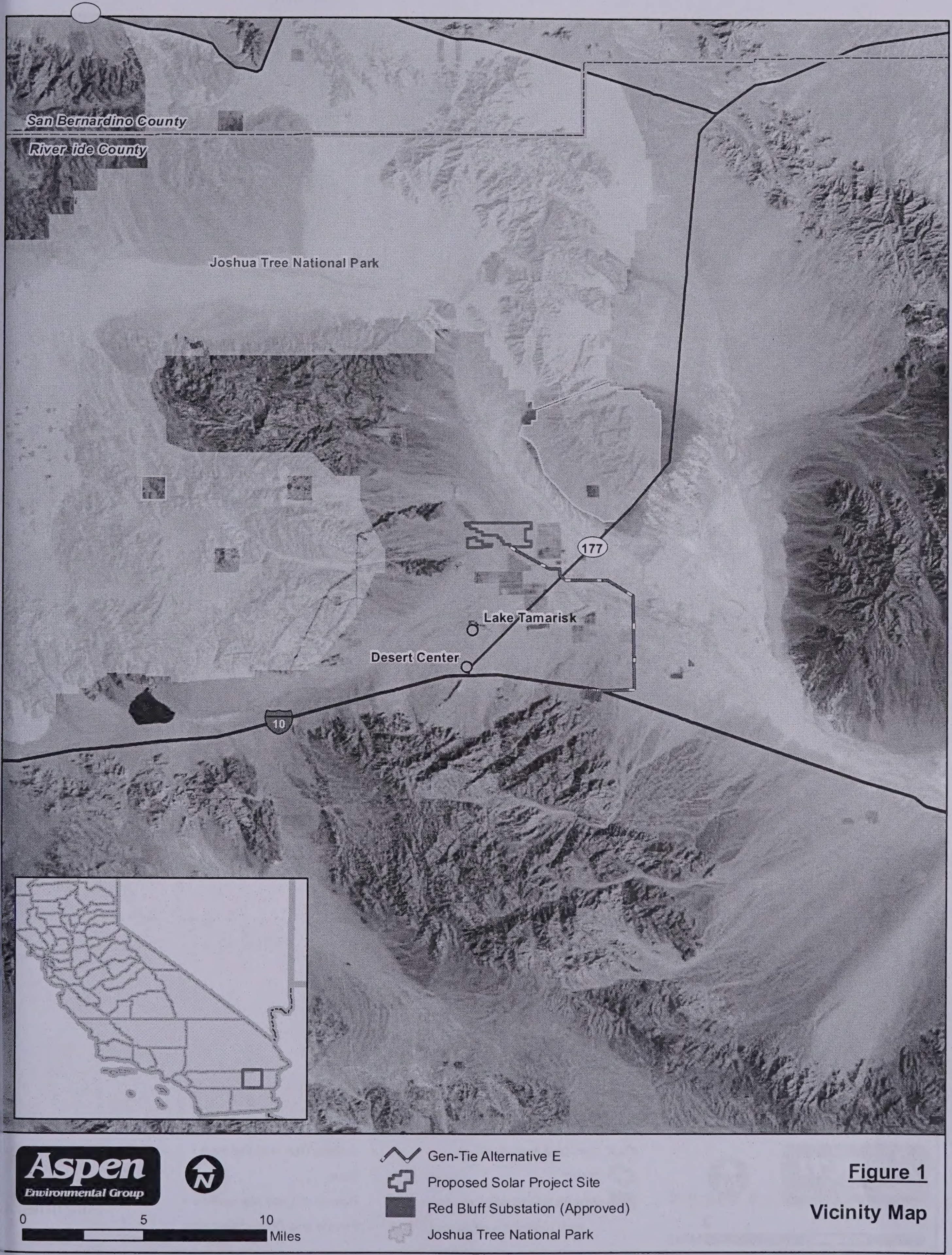
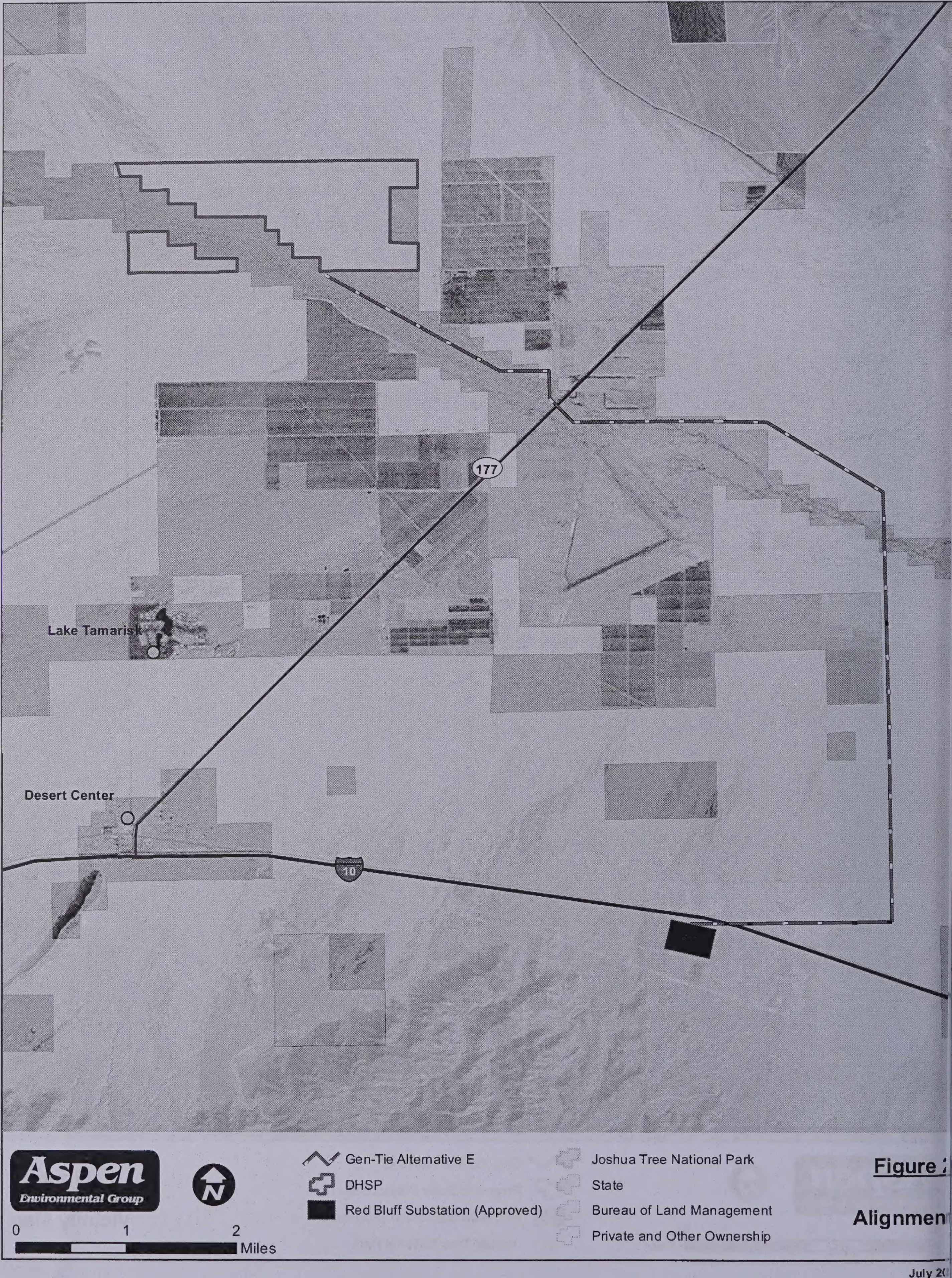

San Bernardino County
Riverside County
Joshua Tree National Park
177
Lake Tamarisk
Desert Center
10
Aspen Environmental Group
N
0
5
10
Miles
Gen-Tie Alternative E
Proposed Solar Project Site
Red Bluff Substation (Approved)
Joshua Tree National Park

Figure 1

Vicinity Map

July 2012


Lake Tamarisk
Desert Center
177
10
Aspen Environmental Group
N
0
1
2
Miles
Gen-Tie Alternative E
DHSP
Red Bluff Substation (Approved)
Joshua Tree National Park
State
Bureau of Land Management
Private and Other Ownership

Figure

Alignmen

July 20

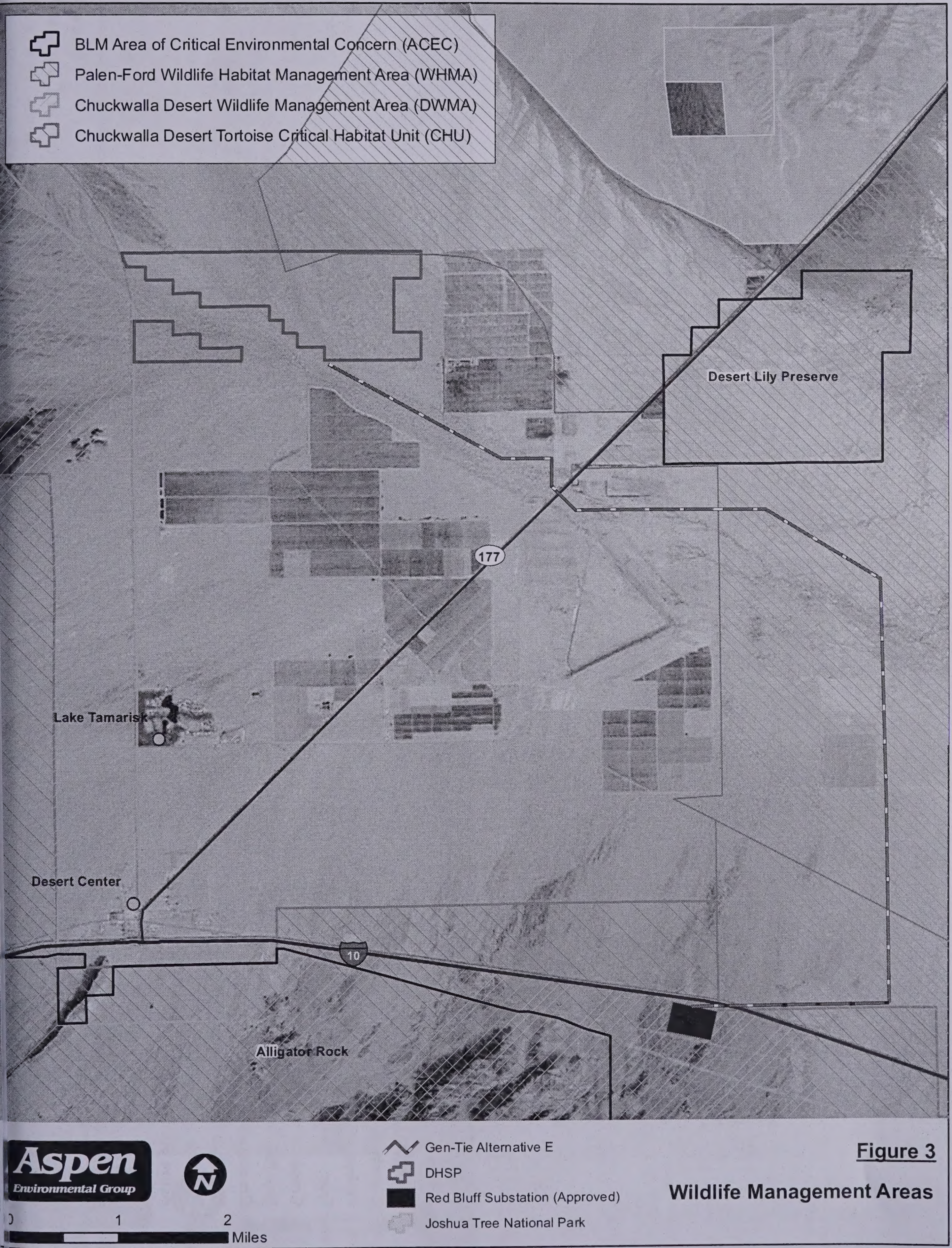

BLM Area of Critical Environmental Concern (ACEC)
Palen-Ford Wildlife Habitat Management Area (WHMA)
Chuckwalla Desert Wildlife Management Area (DWMA)
Chuckwalla Desert Tortoise Critical Habitat Unit (CHU)
Desert Lily Preserve
177
Lake Tamarisk
Desert Center
10
Alligator Rock
Aspen Environmental Group
N
0
1
2
Miles
Gen-Tie Alternative E
DHSP
Red Bluff Substation (Approved)
Joshua Tree National Park

Figure 3

Wildlife Management Areas

July 2012

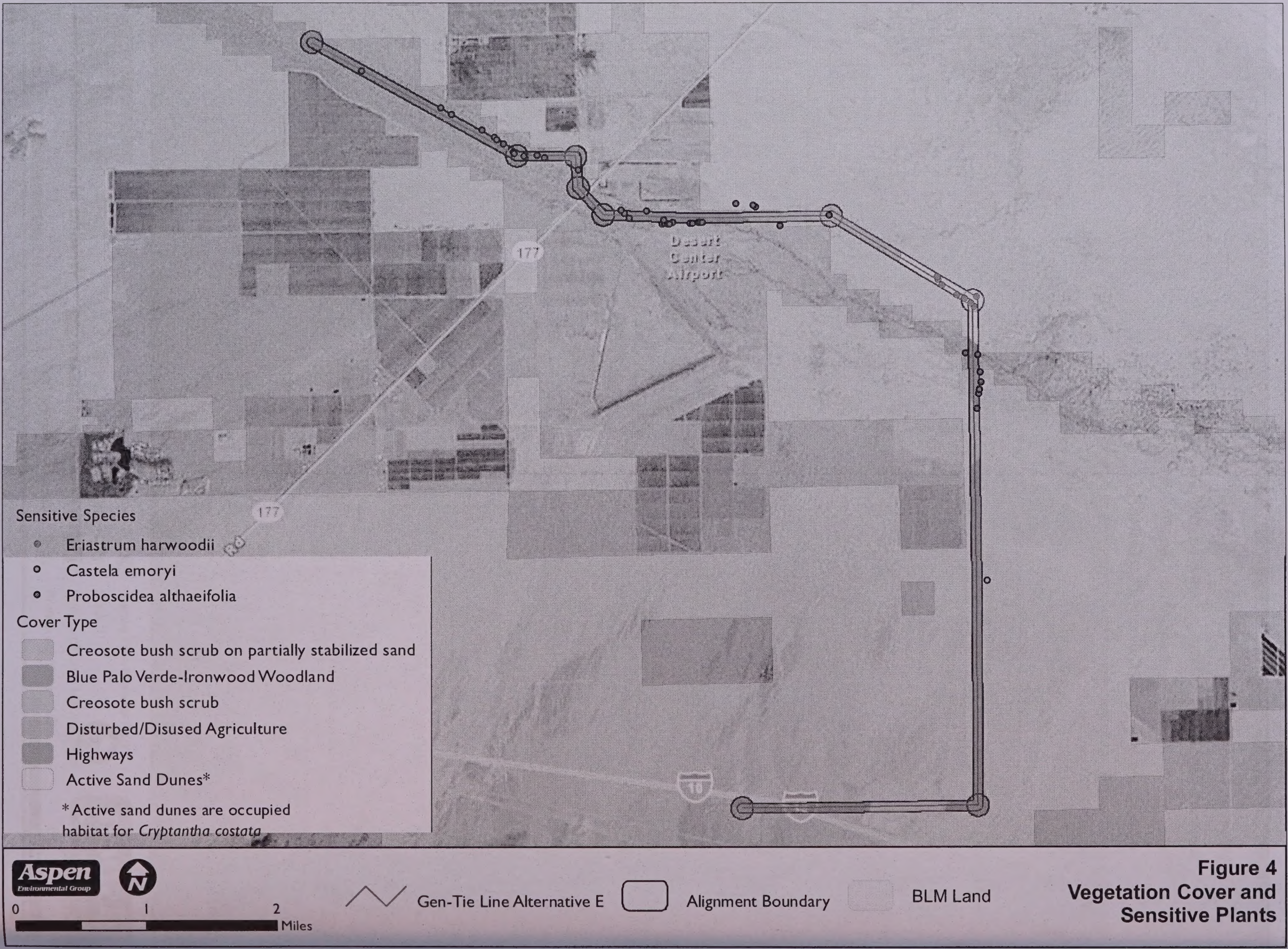

Desert Center Airport
177
177
10
Sensitive Species
● Eriastrum harwoodii
○ Castela emoryi
● Proboscidea althaeifolia
Cover Type
▨ Creosote bush scrub on partially stabilized sand
▨ Blue Palo Verde-Ironwood Woodland
▨ Creosote bush scrub
▨ Disturbed/Disused Agriculture
▨ Highways
▨ Active Sand Dunes*
* Active sand dunes are occupied habitat for *Cryptantha costata*
Aspen Environmental Group
N
0
1
2
Miles
Gen-Tie Line Alternative E
Alignment Boundary
BLM Land

Figure 4
Vegetation Cover and Sensitive Plants

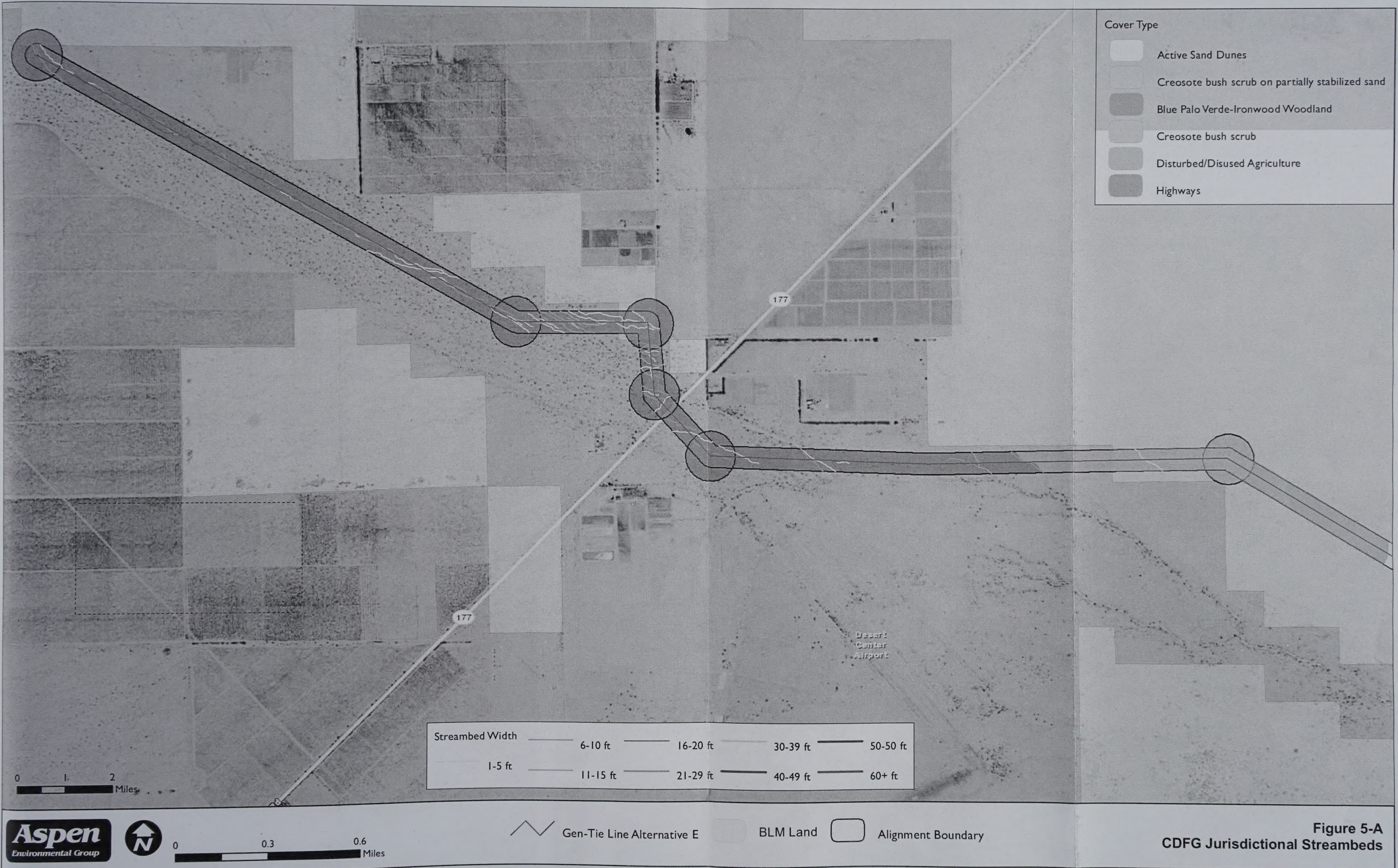


Figure 5-A
CDFG Jurisdictional Streambeds

June 2012

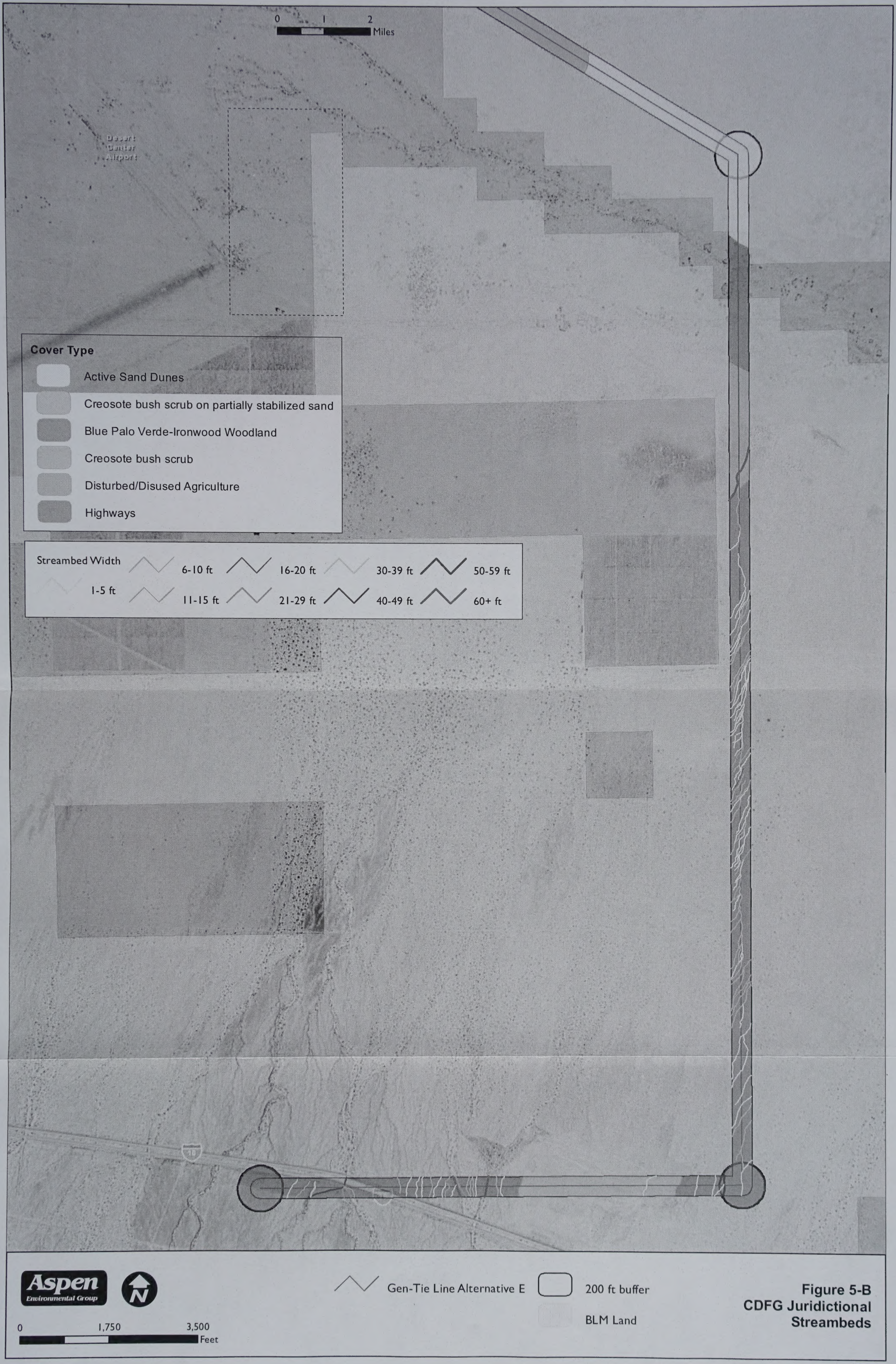
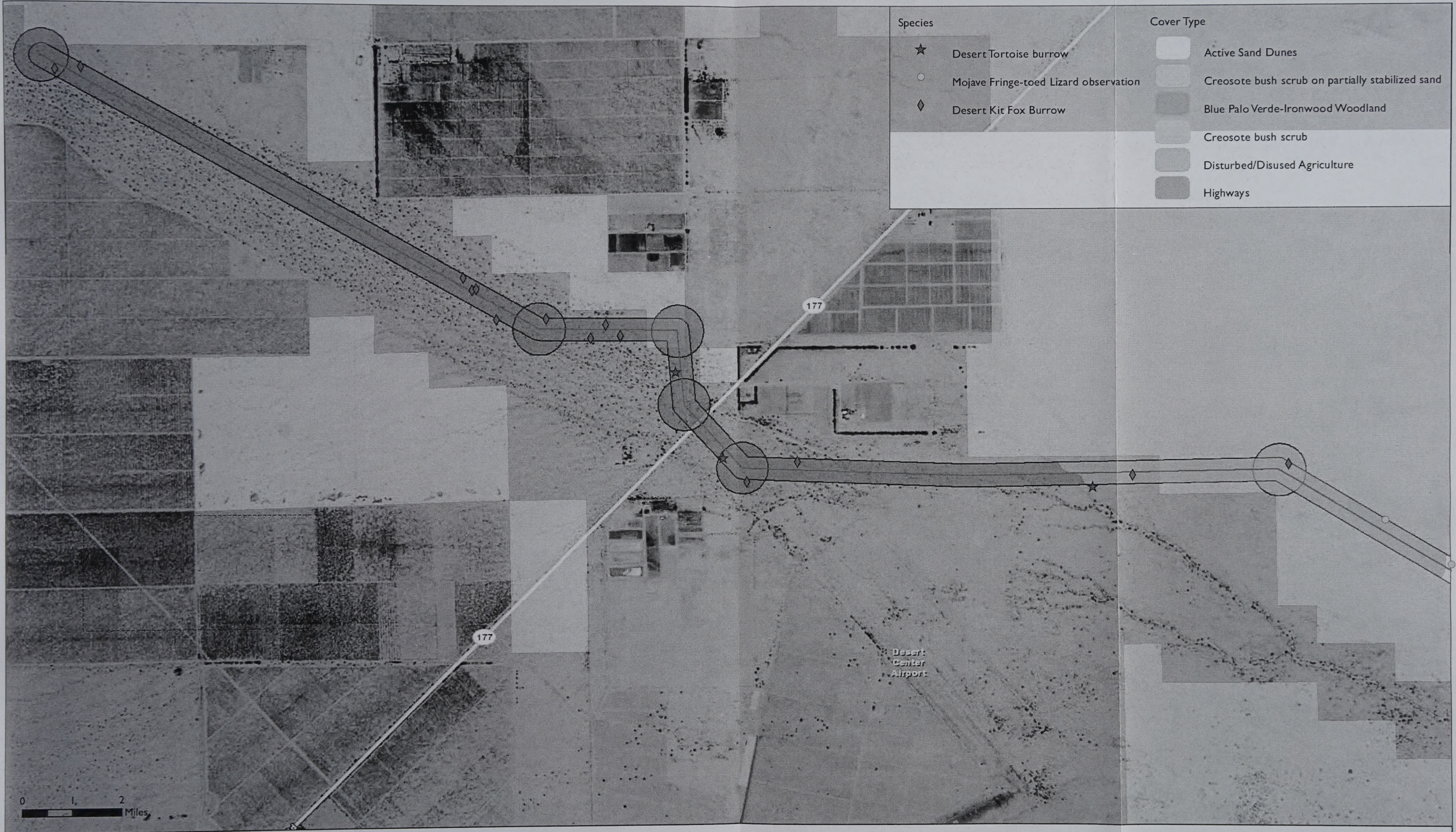


Figure 5-B
CDFG Juridictional Streambeds

June 2012



Aspen Environmental Group

Figure 6-A
Sensitive Wildlife Resources

June 2012

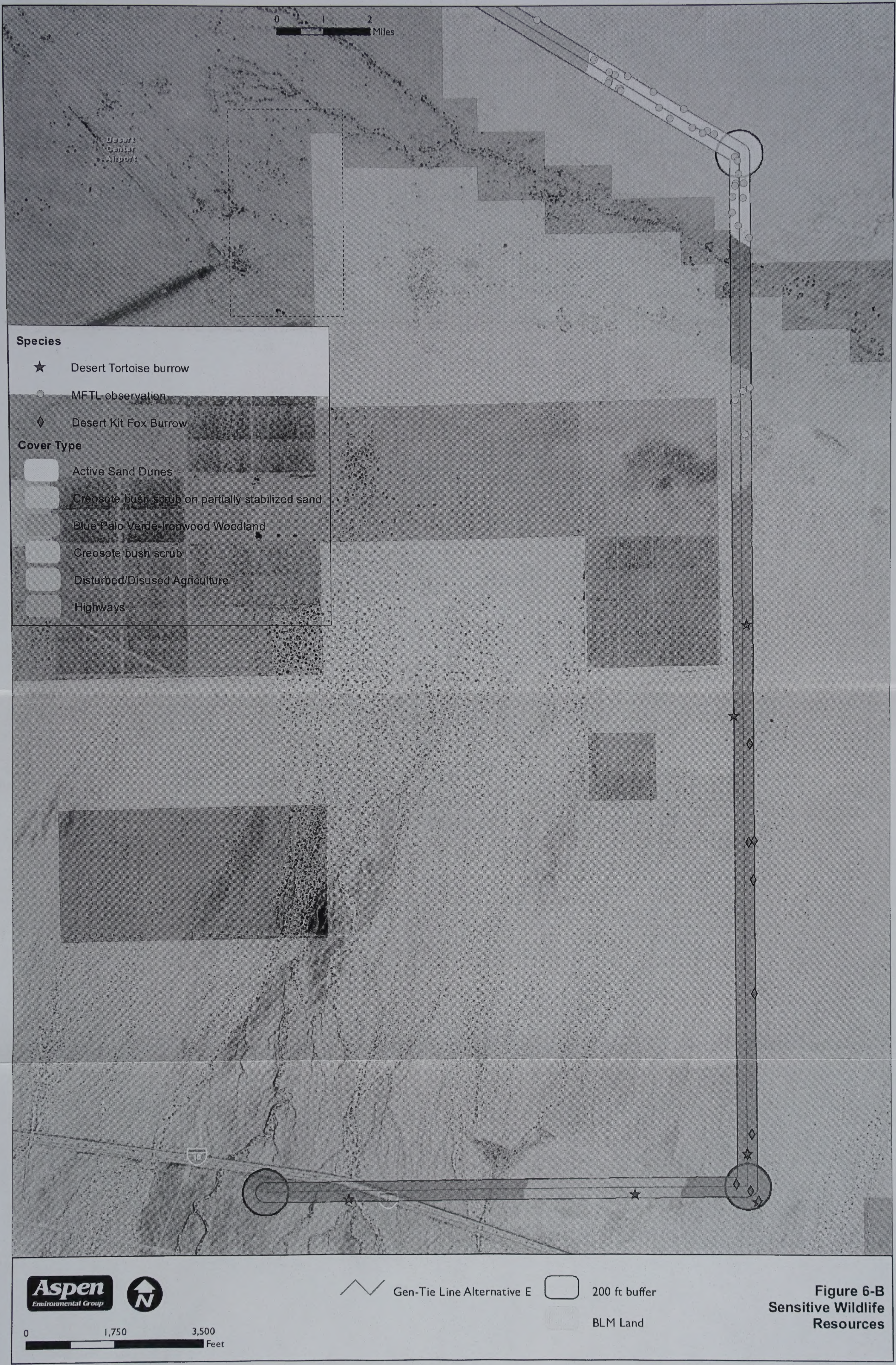


Figure 6-B
Sensitive Wildlife Resources

June 2012

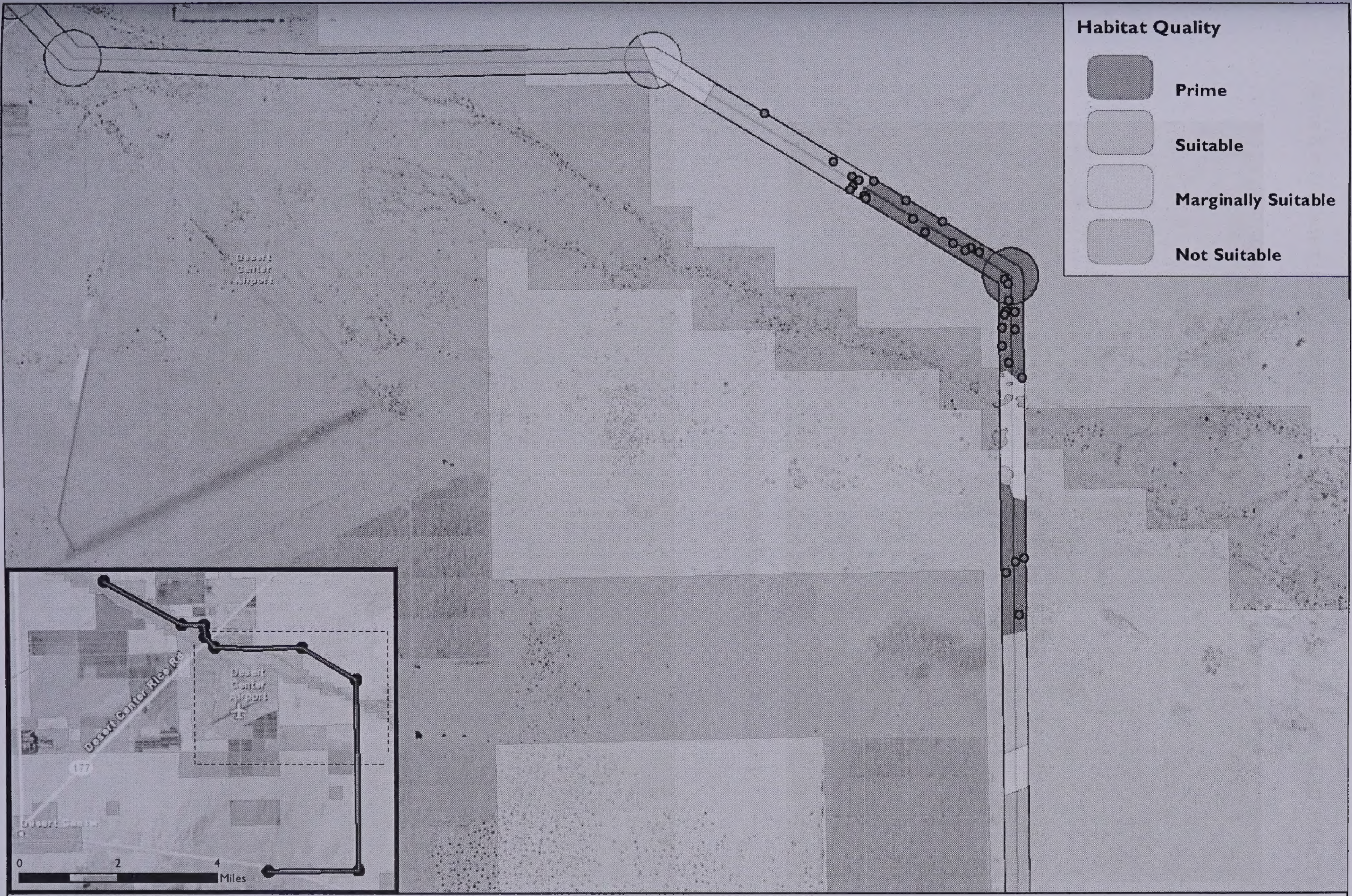


Figure 7
Mojave Fringe-toed Lizard
Habitat and Sightings

June 2012

Figure 8:enXco Desert Harvest Alternative Gen-tie E Photos

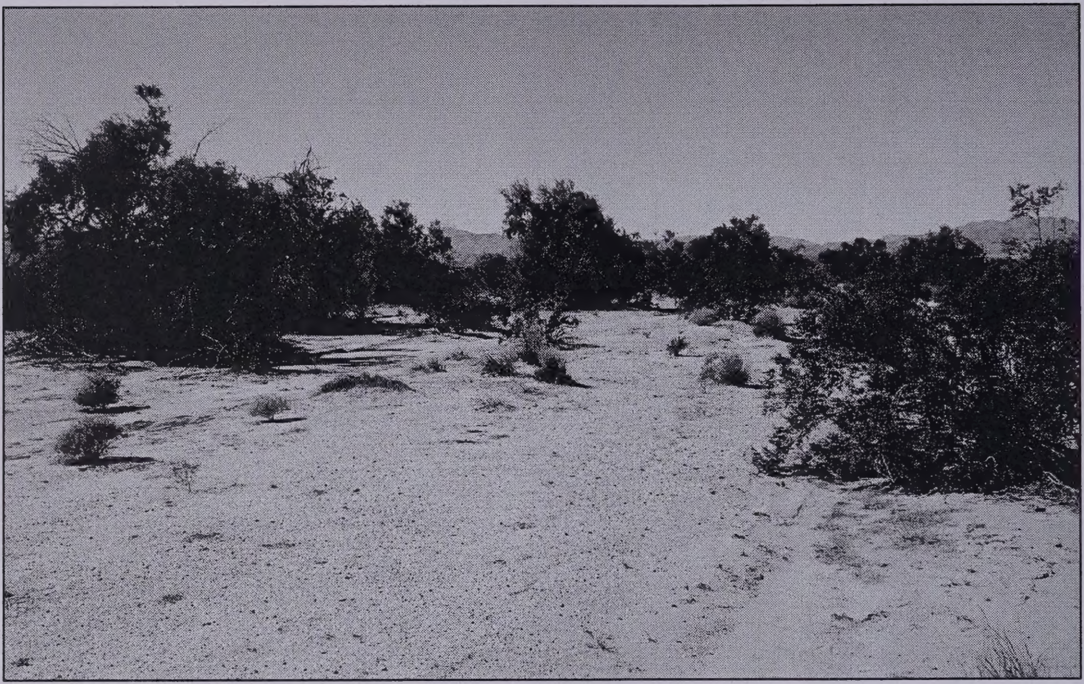


Photo 1. Typical example of desert wash woodland in project area.

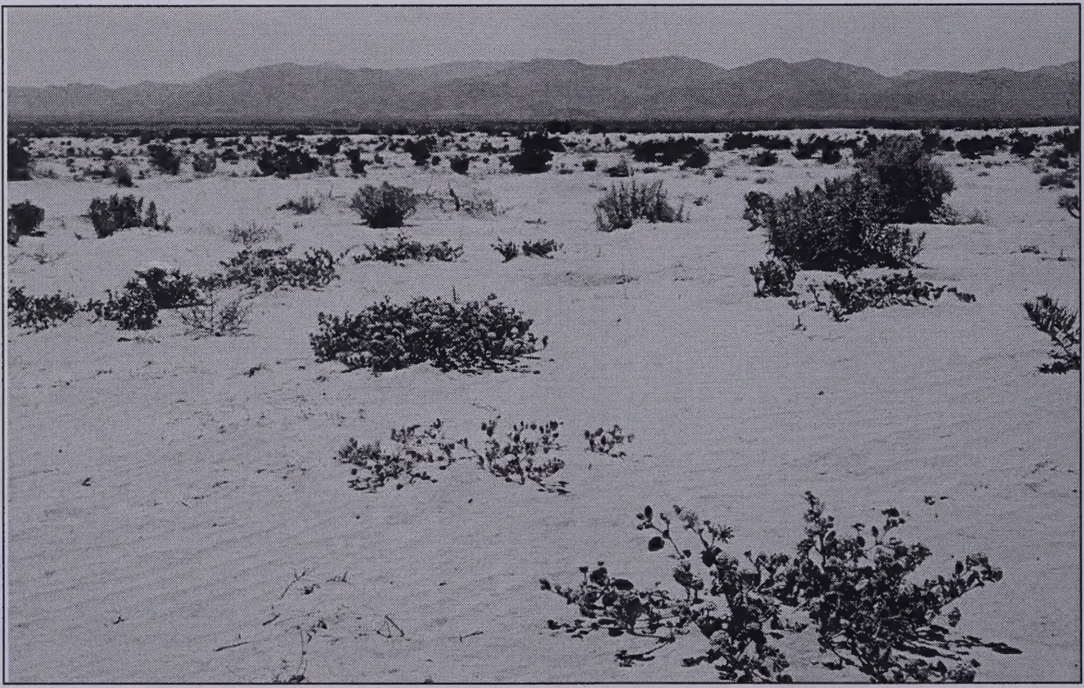


Photo 2. Typical example of active sand dunes in project area.

Figure 8:enXco Desert Harvest Alternative Gen-tie E Photos

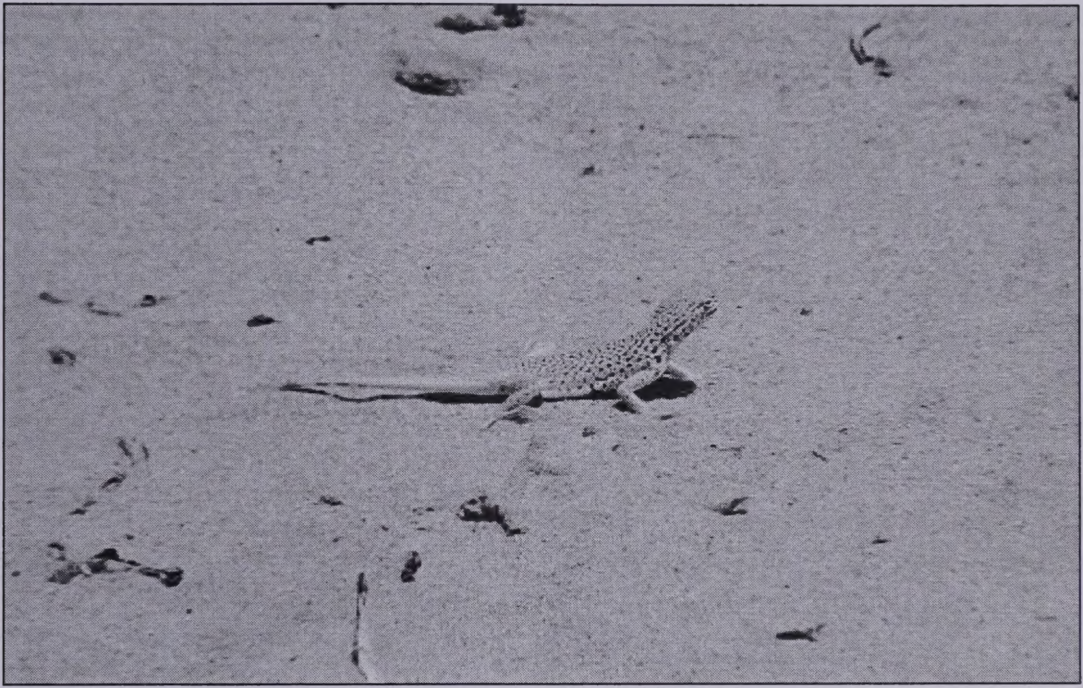


Photo 3. Mojave fringe-toed lizard observed in project area.

Photo 4. Harwood's eriastrum observed in project area.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
USGS Quads: Corn Spring, Desert Center, East of Victory Pass, Palen Lake, Sidewinder Valley, and Victory Pass

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Antrozous pallidus*** pallid bat	AMACC10010			G5	S3	SC
2	***Astragalus insularis var. harwoodii*** Harwood's milk-vetch	PDFAB0F491			G5T3	S2.2?	2.2
3	***Athene cunicularia*** burrowing owl	ABNSB10010			G4	S2	SC
4	***Ayenia compacta*** California ayenia	PDSTE01020			G4	S3?	2.3
5	***Castela emoryi*** Emory's crucifixion-thorn	PDSIM03030			G4	S2S3	2.3
6	***Colubrina californica*** Las Animas colubrina	PDRHA05030			G4	S2S3.3	2.3
7	***Coryphantha alversonii*** Alverson's foxtail cactus	PDCAC0X060			G3	S3.2	4.3
8	***Desert Fan Palm Oasis Woodland***	CTT62300CA			G3	S3.2	
9	***Ditaxis claryana*** glandular ditaxis	PDEUP080L0			G4G5	S1	2.2
10	***Ditaxis serrata var. californica*** California ditaxis	PDEUP08050			G5T2T3	S2	3.2
11	***Eriastrum harwoodii*** Harwood's eriastrum	PDPLM030B1			G2	S2	1B.2
12	***Eumops perotis californicus*** western mastiff bat	AMACD02011			G5T4	S3?	SC
13	***Falco mexicanus*** prairie falcon	ABNKD06090			G5	S3	
14	***Gopherus agassizii*** desert tortoise	ARAAF01010	Threatened	Threatened	G4	S2	
15	***Koeberlinia spinosa ssp. tenuispina*** slender-spined all-thorn	PDCPP05012			G4T4	S2.2	2.2
16	***Macrotus californicus*** California leaf-nosed bat	AMACB01010			G4	S2S3	SC
17	***Matelea parvifolia*** spear-leaf matelea	PDASC0A0J0			G5?	S2.2	2.3
18	***Mentzelia puberula*** Darlington's blazing star	PDLOA031F0			G4	S2	2.2
19	***Neotoma albigula venusta*** Colorado Valley woodrat	AMAFF08031			G5T3T4	S1S2	
20	***Ovis canadensis nelsoni*** Nelson's bighorn sheep	AMALE04013			G4T4	S3	
21	***Penstemon pseudospectabilis ssp. pseudospectabilis*** desert beardtongue	PDSCR1L562			G4G5T3T5	S3	2.2
22	***Selaginella eremophila*** desert spike-moss	PPSEL010G0			G4	S2.2?	2.2
23	***Senna covesii*** Cove's cassia	PDFAB491X0			G5?	S2	2.2
24	***Toxostoma bendirei*** Bendire's thrasher	ABPBK06050			G4G5	S3	SC

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	***Toxostoma lecontei*** Le Conte's thrasher	ABPBK06100			G3	S3	SC
26	***Wislizenia refracta ssp. palmeri*** Palmer's jackass clover	PDCPP09015			G5T2T4	S2?	2.2

Attachment 1: enXco Desert Harvest Solar Project: Gen-tie Alternative E

Latin Name	**Common Name**		
VASCULAR PLANTS		**Abundance**	**Voucher**
AMARANTHACEAE	AMARANTH FAMILY		
Amaranthus blitoides	Prostrate pigweed	Scarce	
Amaranthus fimbriatus	Fringed amaranth	Sarce	4554
Tidestromia oblongifolia *(T. suffriticosa var. oblongifolia)*	Honeysweet	Uncommon	4549
ASCLEPIADACEAE	MILKWEED FAMILY		
Asclepias erosa	Desert milkweed	Uncommon	
Asclepias subulata	Rush milkweed	Uncommon	
Sarcostemma hirtellum	Rambling milkvine	Scarce	
ASTERACEAE	ASTER FAMILY		
Ambrosia dumosa	White bursage, burrobush	Common	
Ambrosia ilicifolia	Holly leaved bursage	Scarce	4550
Bebbia juncea	Sweetbush	Uncommon	
Chaenactis carphoclina	Pincushion	Uncommon	
Chaenactis fremontii	Fremont pincushion	Uncommon	
Chaenactis stevioides	Broad-flowered pincushion	Uncommon	4686
Encelia farinosa	Brittlebush	Uncommon	
Encelia frutescens	Rayless encelia	Occasional	
Geraea canescens	Desert sunflower	Occasional	
Hymenoclea salsola	Cheesebush	Occasional	
Malacothrix glabrata	Desert dandelion	Occasional	
Palafoxia arida	Spanish needles	Common	
Pectis papposa	Chinchweed	Occasional	4545
Perityle emoryi	Emory rock-daisy	Uncommon	
Psathyrotes ramosissima	Velvet rosettes	Occasional	
Stephanomeria pauciflora	Desert straw	Uncommon	
Trixis californica	American threefold	Scarce	4551
BORAGINACEAE	BORAGE FAMILY		
Amsinckia tessellata	Checker fiddleneck	Uncommon	
Cryptantha angustifolia	Narrowleaf cryptantha	Occasional	4688
Cryptantha barbigera	Bearded cryptantha	Uncommon	
** *Cryptantha costata*	Ribbed cryptantha	Uncommon	4682
Cryptantha maritima	White Haired Forget me not	Uncommon	
Cryptantha nevadensis	Nevada cryptantha	Uncommon	
Tiquilia plicata (Coldenia plicata)	Plicate tiquilia	Scarce	4690
BRASSICACEAE	MUSTARD FAMILY		
* *Brassica tournefortii*	Sahara mustard, wild turnip	Uncommon	
Dithyrea californica	California spectacle pod	Scarce	4684
Lepidium lasiocarpum	Sand peppergrass	Scarce	
CACTACEAE	CACTUS FAMILY		
Mamillaria tetrancistra	Fish-hook cactus	Scarce	
Opuntia basilaris v. basilaris	Beavertail cactus	Scarce	
Cylindropuntia echinocarpa	Silver cholla	Scarce	
Cylindropuntia ramosissima	Pencil cholla	Scarce	
CARYOPHYLLACEAE	CARNATION FAMILY		
Achyronychia cooperi	Onyx flower	Scarce	4691

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site by Aspen. Others may have been overlooked or unidentifiable due to season (amphibians are active during rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.). Plants were identified using keys, descriptions, and illustrations in Baldwin et al. (2002), and Munz (1974). Taxonomy and nomenclature generally follow Baldwin et al. (2002) for plants, Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals.. Vouchered plant specimens donated to the UC Riverside Herbarium or Rancho Santa Ana Botanic Garden are indicated by Justin Wood's collection numbers, at right.

Attachment 1: enXco Desert Harvest Solar Project: Gen-tie Alternative E

Latin Name	**Common Name**		
CHENOPODIACEAE	GOOSEFOOT FAMILY		
Atriplex polycarpa	Allscale	Common	
* *Salsola tragus*	Russian thistle	Occasional	4559
CUCURBITACEAE	GOURD FAMILY		
Brandegea bigelovii	Brandegea	Uncommon	
Cucurbita palmata	Coyote melon	Scarce	
EUPHORBIACEAE	SPURGE FAMILY		
Chamaesyce micromera *(Euphorbia micromera)*	Sonoran sandmat	Occasional	
Chamaesyce polycarpa *(Euphorbia polycarpa)*	Sand mat	Occasional	
Chamaesyce setiloba *(Euphorbia setiloba)*	Yuma spurge	Occasional	4558
Croton californicus	California croton	Uncommon	
Ditaxis lanceolata	Narrow-leaved ditaxis	Scarce	4555
Ditaxis neomexicana	Common ditaxis	Uncommon	4547
Ditaxis serrata *(Ditaxis serrata* var. *serrata)*	Yuma ditaxis	Uncommon	
Stillingia spinulosa	Annual stillingia	Uncommon	
FABACEAE	PEA FAMILY		
Acacia greggii	Catclaw acacia	Uncommon	
Astragalus aridus	Annual desert milk-vetch	Occasional	4681
Astragalus lentiginosus var. variabilis	Freckled milk-vetch	Occasional	4692
Dalea mollis	Silky dalea	Occasional	4687
Dalea mollissima	Rust dalea	Occasional	
Lupinus arizonicus	Arizona lupine	Occasional	
Marina parryi	Parry dalea	Scarce	
Olneya tesota	Desert ironwood	Abundant	
Parkinsonia florida	Blue palo verde	Occasional	
Prosopis glandulosa	Mesquite	Uncommon	4561
Psorothamnus emoryi *(Dalea emoryi)*	Emory indigo-bush, dye-weed	Uncommon	
Psorothamnus schottii *(Dalea schottii)*	Indigo-bush	Uncommon	
Psorothamnus spinosus *(Dalea spinosa)*	Smoke tree	Uncommon	
FOUQUIERIACEAE	OCOTILLO FAMILY		
Fouquieria splendens	Ocotillo	Scarce	
HYDROPHYLLACEAE	WATERLEAF FAMILY		
Nama demissum	Purple mat	Scarce	
Phacelia distans	Common heliotrope	Uncommon	
KRAMERIACEAE	KRAMERIA FAMILY		
Krameria grayii	White rhatany	Occasional	
LAMIACEAE	MINT FAMILY		
Hyptis emoryi	Desert lavender	Scarce	
Eremalche rotundifolia	Desert fivespot	Scarce	
Salvia columbariae	Chia	Uncommon	
MARTYNIACEAE	UNICORN PLANT FAMILY		
** *Proboscidea althaeifolia*	Unicorn plant	Uncommon	4541
MOLLUGINACEAE	CARPETWEED FAMILY		
* *Mollugo cerviana*	Carpet weed	Scarce	4542

Attachment 1: enXco Desert Harvest Solar Project: Gen-tie Alternative E

Latin Name	**Common Name**		
NYCTAGINACEAE	FOUR O'CLOCK FAMILY		
Abronia villosa var. villosa	Sand verbena	Occasional	4685
Allionia incarnata	Trailing windmills	Scarce	
Boerhavea coccinea	Red ringstem	Scarce	
Boerhavea wrightii	Wright's boerhavia	Occasional	4540
ONAGRACEAE	EVENING PRIMROSE FAMILY		
Camissonia claviformis	Clavate evening primrose	Scarce	
Oenothera deltoides	Dune primrose	Occasional	
PAPAVERACEAE	POPPY FAMILY		
Argemone corymbosa	Mojave prickly poppy	Scarce	
Eschscholzia minutiflora	Small-flowered poppy	Uncommon	
PLANTAGINACEAE	PLANTAIN FAMILY		
Plantago ovata	Desert plantain	Uncommon	
POLEMONIACEAE	PHLOX FAMILY		
** *Eriastrum harwoodii*	Harwood's eriastrum	Uncommon	4683
POLYGONACEAE	BUCKWHEAT FAMILY		
Eriogonum deflexum	Skeleton weed	Occasional	
Eriogonum pusillum	Puny buckwheat	Uncommon	
Eriogonum reniforme	Kidney-leaved buckwheat	Uncommon	
RESEDACEAE	MIGNONETTE FAMILY		
Oligomeris linifolia	Narrowleaf oligomeris		
SIMMONDSIACEAE	JOJOBA FAMILY		
Simmondsia chinensis	Jojoba	Scarce	
SIMAROUBACEAE			
** *Castela emoryi*	Crucifixion thorn	Uncommon	
(Single individual located just outside of the alignment)			
SOLANACEAE	NIGHTSHADE FAMILY		
Datura discolor	Jimsonweed, desert thorn-apple	Occasional	
Lycium andersonii	Anderson thornbush	Scarce	
Physalis crassifolia	Thick-leaf ground cherry	Scarce	
VISCACEAE	MISTLETOE FAMILY		
Phoradendron californicum	Desert mistletoe	Scarce	4560
ZYGOPHYLLACEAE	CALTROP FAMILY		
Fagonia laevis	Smooth-stem fagonia	Uncommon	
Kallstroemia californica	California caltrop	Uncommon	
Larrea tridentata	Creosote bush	Abundant	
LILIACEAE	LILY FAMILY		
Hesperocallis undulata	Desert lily	Uncommon	4689
POACEAE	GRASS FAMILY		
Aristida californica	California three-awn	Uncommon	
Bouteloua aristidoides	Needle grama	Uncommon	
Bouteloua barbata	Sixweeks grama	Scarce	
Pleuraphis rigida (Hilaria rigida)	Big galleta	Occasional	
* *Schismus barbatus*	Mediterranean schismus	Uncommon	
VERTEBRATE ANIMALS			
REPTILIA	**REPTILES**		
TESTUDINIDAE	LAND TORTOISES		
** *Gopherus agassizii* *(Xerobates agassizi)*	Desert tortoise	Inactive, degraded burrows	
IGUANIDAE	IGUANID LIZARDS		
Dipsosaurus dorsalis	Desert iguana		

Attachment 1: enXco Desert Harvest Solar Project: Gen-tie Alternative E

Latin Name	**Common Name**
PHRYNOSOMATIDAE	SPINY LIZARDS AND RELATIVES
Callisaurus draconoides	Zebra-tailed lizard
** *Uma scoparia*	Mojave fringe-toed lizard
Uta stansburiana	Side-blotched lizard
Urosaurus graciosus	Long-tailed brush lizard
Phrynosoma platyrhinos	Desert horned lizard
TEIIDAE	WHIPTAILS
Cnemidophorus tigris	Western whiptail
AVES	**BIRDS**
CATHARTIDAE	VULTURES
Cathartes aura	Turkey vulture
ACCIPITRIDAE	HAWKS, EAGLES, HARRIERS
Buteo jamaicensis	Red-tailed hawk
FALCONIDAE	FALCONS
** *Falco mexicanus*	Prairie falcon
Falco sparverius	American kestrel
PHASIANIDAE	GROUSE AND QUAIL
Callipepla gambelii	Gambel's quail
COLUMBIDAE	PIGEONS AND DOVES
* *Streptopelia decaocto*	Eurasian collared-dove
Zenaida asiatica	White-winged dove
Zenaida macroura	Mourning dove
CUCULIDAE	CUCKOOS
Geococcyx californianus	Greater roadrunner
CAMPRIMULGIDAE	NIGHTJARS
Chordeiles acutipennis	Lesser nighthawk
TROCHILIDAE	HUMMINGBIRDS
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
PICIDAE	WOODPECKERS
Picoides scalaris	Ladder-backed woodpecker
TYRANNIDAE	TYRANT FLYCATCHERS
Sayornis saya	Say's phoebe
Myiarchus cinerascens	Ash-throated flycatcher
HIRUNDINIDAE	SWALLOWS
Hirundo rustica	Barn swallow
CORVIDAE	CROWS AND JAYS
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
REMIZIDAE	VERDINS
Auriparus flavipes	Verdin
TROGLODYTIDAE	WRENS
Thryomanes bewickii	Bewick's wren
MUSCICAPIDAE	THRUSHES AND ALLIES
** *Polioptila melanura*	Black-tailed gnatcatcher
MIMIDAE	MOCKINGBIRDS AND THRASHERS
Mimus polyglottos	Northern mockingbird
PTILOGONATIDAE	SILKY FLYCATCHERS
Phainopepla nitens	Phainopepla
LANIIDAE	SHRIKES
** *Lanius ludovicianus*	Loggerhead shrike

Attachment 1: enXco Desert Harvest Solar Project: Gen-tie Alternative E

Latin Name	**Common Name**	
EMBERIZIDAE	SPARROWS, WARBLERS, TANAGERS	
Chondestes grammacus	Lark sparrow	
Amphispiza bilineata	Black-throated sparrow	
Zonotrichia leucophrys	White-crowned sparrow	
Icterus bullockii	Bullock's oriole	
FRINGILLIDAE	FINCHES	
Carpodacus mexicanus	House finch	
Carduelis psaltria	Lesser goldfinch	
MAMMALIA	**MAMMALS**	
LEPORIDAE	HARES AND RABBITS	
Lepus californicus	Black-tailed hare	
SCIURIDAE	SQUIRRELS	
Citellus tereticaudis	Round-tailed ground squirrel	
HETEROMYIDAE	POCKET MICE	
Dipodomys sp.	Kangaroo rat	Burrows
CRICETIDAE	RATS AND MICE	
Neotoma lepida	Desert wood rat	
CANIDAE	FOXES, WOLVES AND COYOTES	
Canis latrans	Coyote	Tracks, scat
Vulpes macrotis arsipus	Kit fox	Burrows
CERVIDAE	ELKS, MOOSE, CARIBOU, DEER	
Odocoileus hemionus	Mule deer	Tracks

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Scientific Name: *Eriastrum harwoodii*

Common Name: Harwood's eriastrum

Species Found? ☑ Yes ☐ No ______ If not, why?
Total No. Individuals 50+ Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.
Collection? If yes: 4683 Number RSA-POM Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information

Phenology: 0 % vegetative 100 % flowering 0 % fruiting

Animal Information

______ # adults ______ # juveniles ______ # larvae ______ # egg masses ______ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Chuckwalla Valley, 3.5 miles due east of Rice Hwy (177) and 4.5 miles due north of Interstate 10. Western edge of the much larger Palen Dry Lake Dune System. Plants observed along a roughly 1 mile long transect extending to the northwest.

County: Riverside Landowner / Mgr.: ______
Quad Name: East of Victory Pass Elevation: 490 ft.
T 5S R 16E Sec 2, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 5S R 16E Sec 11, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimbel Juno
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy 3 meters meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: 33 45' 30" N 115 17' 01" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Active dune system with fine wind-blown sands. Tallest dunes roughly ten feet in height. Growing with Astragalus aridus, Astragalus lentiginosus, Oenother deltoides, Cryptantha costata, etc.

Please fill out separate form for other rare taxa seen at this site. Cryptantha costata and Uma scoparia

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space
Visible disturbances: Some non-native annuals such as Salsola, but do not seem to be affecting the dune function.
Threats: Alternative transmission line possible in vicinity, not likely to be built.
Comments:

Determination: *(check one or more, and fill in blanks)*
☑ Keyed (cite reference): Jepson 1993
☐ Compared with specimen housed at: ______
☑ Compared with photo / drawing in: CalPhotos
☐ By another person (name): ______
☐ Other: ______

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

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Sacramento, CA 95811
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Date of Field Work (mm/dd/yyyy): 04/23/2012

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Elm Code ________ Occ. No. ________
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Scientific Name: *Cryptantha costata*

Common Name: Ribbed cryptantha

Species Found? ☑ Yes ☐ No ________ If not, why?
Total No. Individuals 100+ Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? ________ Yes, Occ. # ☐ no ☑ unk.
Collection? If yes: 4682 Number RSA-POM Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information

Phenology: 0 % vegetative 75 % flowering 25 % fruiting

Animal Information

___ # adults ___ # juveniles ___ # larvae ___ # egg masses ___ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Chuckwalla Valley, 3.5 miles due east of Rice Hwy (177) and 4.5 miles due north of Interstate 10. Western edge of the much larger Palen Dry Lake Dune System. Plants observed along a roughly 1 mile long transect extending to the northwest.

County: Riverside Landowner / Mgr.: ________
Quad Name: East of Victory Pass Elevation: 490 ft.
T 5S R 16E Sec 2, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 5S R 16E Sec 11, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimbel Juno
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy 3 meters meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: 33 45' 30" N 115 17' 01" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Active dune system with fine wind-blown sands. Tallest dunes roughly ten feet in height. Growing with Astragalus aridus, Astragalus lentiginosus, Oenother deltoides, Eriastrum harwoodii, etc.

Please fill out separate form for other rare taxa seen at this site. Eriastrum harwoodii and Uma scoparia

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space
Visible disturbances: Some non-native annuals such as Salsola, but do not seem to be affecting the dune function.
Threats: Alternative transmission line possible in vicinity, not likely to be built.
Comments:

Determination: *(check one or more, and fill in blanks)*
☑ Keyed (cite reference): Jepson 1993
☐ Compared with specimen housed at: ________
☑ Compared with photo / drawing in: CalPhotos
☐ By another person (name): ________
☐ Other: ________

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

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Scientific Name: *Castela emoryi*

Common Name: Crucifixion thorn

Species Found? ☑ Yes ☐ No ____ If not, why?
Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? ____ Yes, Occ. # ☑ no ☐ unk.
Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information
Phenology: 100 % vegetative ____ % flowering ____ % fruiting

Animal Information
____ # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Chuckwalla Valley, 5.9 miles due east of Rice Hwy (177) and 2.3 miles due north of Interstate 10. Just southeast of abandoned Jojoba farm.

County: Riverside Landowner / Mgr.: ____
Quad Name: Corn Spring Elevation: 565
T 5S R 16E Sec 23, NW ¼ of NE ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimbel Juno
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy 3 meters meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☑
Coordinates: 33 43' 33.5" N 115 16' 48.2" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Open desert dry wash woodland dominated by desert ironwood.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor
Immediate AND surrounding land use: Open space, abandoned agriculture.
Visible disturbances:
Threats:
Comments: Single individual, appears stressed possibly from drought.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): ____
☐ Compared with specimen housed at: ____
☐ Compared with photo / drawing in: ____
☐ By another person (name): ____
☐ Other: ____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

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Department of Fish and Game
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Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

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Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Date of Field Work (mm/dd/yyyy): 04/23/2012

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California Native Species Field Survey Form

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Scientific Name: *Uma scoparia*

Common Name: Mohave fringe-toed lizard

Species Found? ☑ Yes ☐ No ______ If not, why?
Total No. Individuals 32 Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.
Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information

Phenology: ______% vegetative ______% flowering ______% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
32				

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Chuckwalla Valley, 3.5 miles due east of Rice Hwy (177) and 4.5 miles due north of Interstate 10. Western edge of the much larger Palen Dry Lake Dune System. See attached map for location of the occurrences.

County: Riverside Landowner / Mgr.: ______
Quad Name: East of Victory Pass Elevation: ±490 ft.
T 5S R 16E Sec 2, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T 5S R 16E Sec 11, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimbel Juno
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy 3 meters meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: 33 45' 30" N 115 17' 01" W

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Active dune system with fine wind-blown sands. Tallest dunes roughly ten feet in height. Vegetation consists of Larrea tridentata and Atriplex polycarpa at dune margins and Astragalus aridus, Astragalus lentiginosus, Oenother deltoides, Eriastrum harwoodii, Cryptantha costata in the most active portions of the dunes.

Please fill out separate form for other rare taxa seen at this site. Eriastrum harwoodii and Cryptantha costata

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space
Visible disturbances: Some non-native annuals such as Salsola, but do not seem to be affecting the dune function.
Threats: Alternative transmission line possible in vicinity, not likely to be built.
Comments:

Determination: *(check one or more, and fill in blanks)*
- ☐ Keyed (cite reference): ______
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☐ Other: ______

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

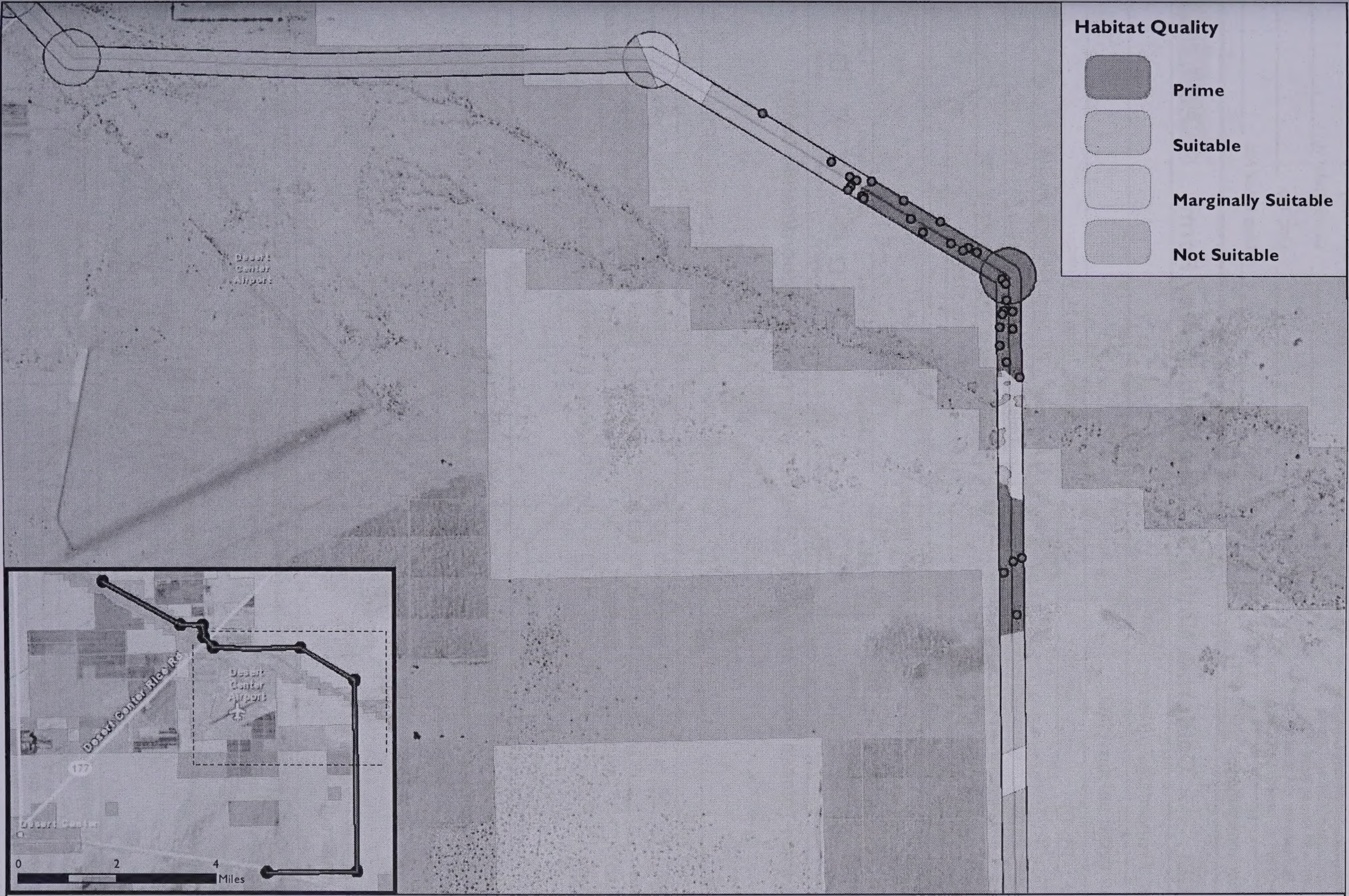

Figure 7
Mojave Fringe-toed Lizard
Habitat and Sightings

June 2012

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EO Index No. ______ Map Index No. ______

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Scientific Name: *Proboscidea althaeifolia*

Common Name: desert unicorn plant

Species Found? ☑ Yes ☐ No ______ If not, why?
Total No. Individuals 36 Subsequent Visit? ☐ yes ☑ no
Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.
Collection? If yes: 4541 Number RSA-POM Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspeneg.com
Phone: (909) 568-5235

Plant Information

Phenology: 0 % vegetative 100 % flowering 0 % fruiting

Animal Information

______ # adults ______ # juveniles ______ # larvae ______ # egg masses ______ # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

***Location Description** (please attach map __AND/OR__ fill out your choice of coordinates, below)*

see attached map

County: Riverside Landowner / Mgr.: Private, MWD, & State of California
Quad Name: Victory Pass Elevation: 205 m
T 45 R 15E Sec 27, SE ¼ of ______ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T ____ R ____ Sec ____, ____ ¼ of ______ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSx
__DATUM:__ **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy ±15ft meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates:

***Habitat Description** (plant communities, dominants, associates, substrates/soils, aspects/slope):*

Creosote scrub with intermittent sandy washes throughout. Vegetation in sandy washes composed of desert ironwood and blue palo verde.

Other rare taxa seen at THIS site on THIS date:
(separate form preferred)

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Mostly natural with a few private residences and abandoned agricultural fields
Visible disturbances: .
Threats: In vicinity of proposed solar project and transmission line alignment.
Comments:

***Determination:** (check one or more, and fill in blanks)*
☑ Keyed (cite reference): Hickman 1993
☐ Compared with specimen housed at: ______
☐ Compared with photo / drawing in: ______
☐ By another person (name): ______
☐ Other: ______

***Photographs:** (check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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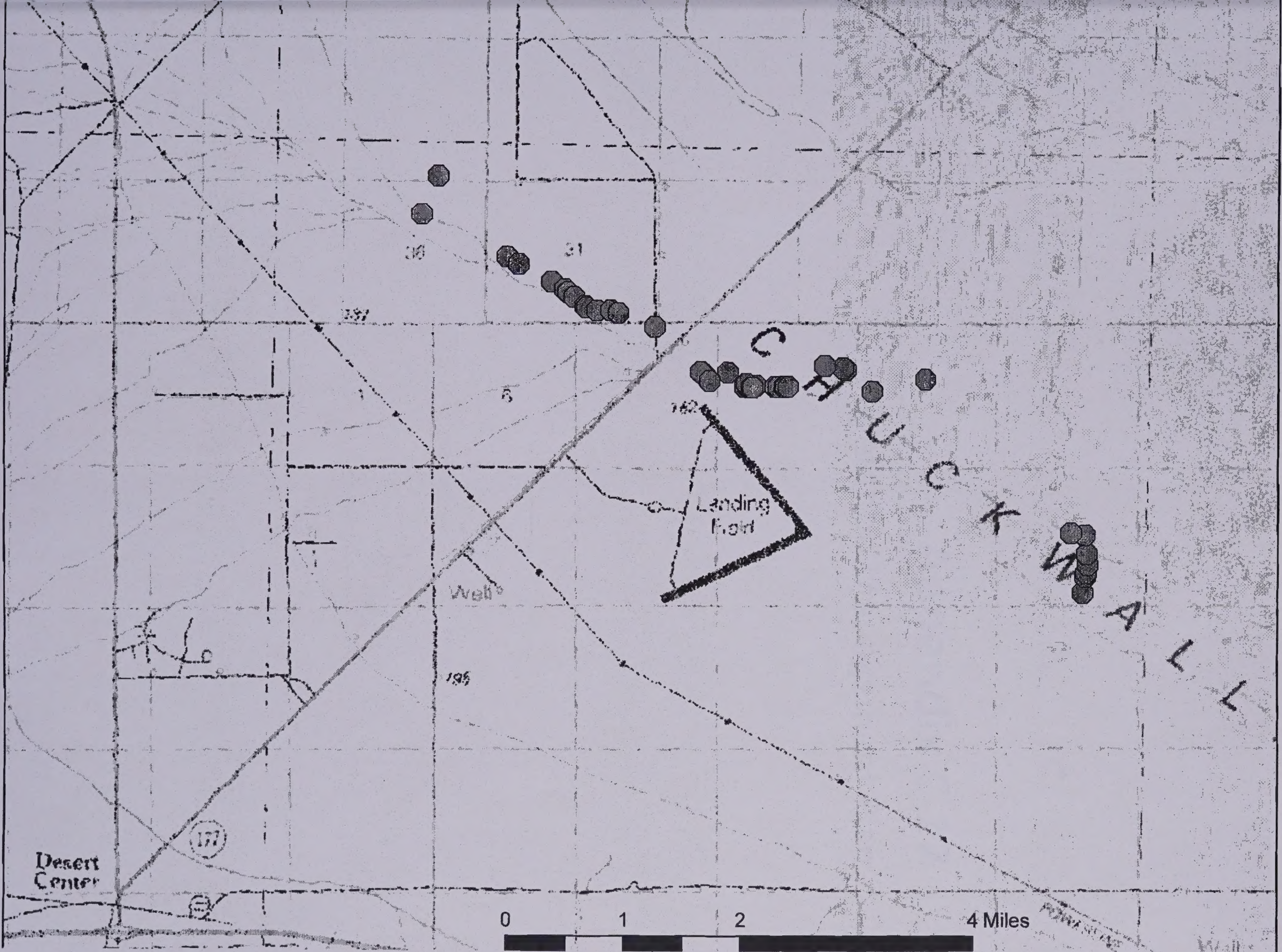

C H U C K W A L L
Landing Field
182
31
36
337
5
1
Well
195
177
Desert Center
0
1
2
4 Miles

Appendix C.17

Vegetation Management Plan

Draft Vegetation Resources Management Plan
Desert Harvest Solar Project

Prepared for:

enXco
5000 Executive Parkway, Suite 140
San Ramon, CA 94583

Prepared by:

Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

July 2012

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Tables

Table 1. Pre-construction cactus and special-status plant survey schedule.
Table 2. Cactus salvage, planting, and maintenance schedule.
Table 3. Sample seed inventory management format.

Abbreviations and Acronyms

BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
DHSP	Desert Harvest Solar Project
DSSF	Desert Sunlight Solar Farm
DWMA	Desert Wildlife Management Area
JTNP	Joshua Tree National Park
NEPA	National Environmental Policy Act
ROW	Right-of-Way
RSABG	Rancho Santa Ana Botanic Garden

1.0 Introduction

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 5 miles north of Desert Center, California. The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2012).

This Vegetation Resources Management Plan was prepared to conform to Applicant measures AM BIO-3 and AM BIO-5, and Mitigation Measure MM VEG-5, of the Draft Environmental Impact Statement (DEIS; BLM 2012). It describes enXco's strategy to minimize adverse effects of the project to native vegetation, soils, and habitat, while recognizing that the primary mitigation for these impacts is the acquisition and long-term protection of off-site vegetation and habitat, described in Mitigation Measure MM VEG-6 of the DEIS. This Plan addresses the revegetation of sites to be temporarily disturbed during construction or other project activities; salvage of native cactus from the site prior to construction; and on-site vegetation management during project O&M.

Mitigation Measure MM VEG-5 of the DEIS directs enXco to reclaim, revegetate, or restore all temporarily disturbed areas, such as temporary access roads, construction work areas, temporary lay-down areas, and staging areas (the full text of the measure appears Section 3.0 of this Plan). Most of the project's temporary disturbance will be within the solar facility, where disturbed areas will largely be beneath solar panels. In these areas, this Vegetation Management Plan is intended to minimize dust, erosion, weed invasion, and fire hazard throughout the solar facility to the extent feasible. In addition, this Plan is intended to prevent or minimize conditions that could attract wildlife into the site, where they likely would be at risk due to project construction, operation and maintenance (O&M), or decommissioning activities.

enXco's proposed generator transmission line (gen-tie line) to the Red Bluff Substation would be constructed on shared poles with the Desert Sunlight Solar Farm (DSSF) gen-tie line. The DSSF Project, now under construction, is located to the immediate north of the DHSP site (Figure 2). The DSSF was recently approved (BLM 2011a; 2011b) and will occupy 3,761 acres when fully built out. If the proposed gen-tie alternative is selected, and if construction of the two gen-tie conductors is concurrent, then vegetation management on the shared gen-tie line will be according to requirements of the DSSF Final EIS (BLM 2011a). For purposes of environmental impact review, the Desert Harvest EIS conservatively assumes the enXco would construct the entire gen-tie line under non-cumulative conditions, but would share the poles of the DSSF gen-tie line under cumulative conditions.

enXco has also prepared a Draft Integrated Weed Management Plan (IWMP; Appendix C.9 of the DEIS) and is now preparing a Closure and Reclamation Plan. Those two plans and this Vegetation Resources Management Plan are intended to supplement one another. Together, they describe the overall approach to vegetation management, weed management, and site closure and reclamation to be implemented over the life of the DHSP.

2.0 Project Description

2.1 Site Description

The DHSP site is located in the upper Chuckwalla Valley, on public lands administered by the BLM in unincorporated Riverside County, approximately 5 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way (ROW) Application consists of two non-contiguous parcels (Figures 1 and 2). The total solar facility project area is approximately 1,208 acres, consisting of 1,051 acres in the larger parcel, and 157 acres in the smaller one. The DEIS analyzes 4 solar project alternatives and 4 gen-tie line alternatives. This section of the Vegetation Management Plan briefly summarizes aspects of the applicant's proposed project and the alternatives that may be relevant to vegetation management. More complete descriptions of the Project and alternatives may be found in Chapter 2 of the DEIS.

The site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford WHMA, also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 3). Some of the private lands to the south and west have been developed as residential and agricultural lands uses. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site.

Two vegetation types cover the proposed solar generator site and generator tie-line Alternatives B, C, and D (Figures 4 and 5): Creosote Bush Scrub and Blue Palo Verde-Ironwood Woodland (also described as Desert Dry Wash Woodland or as Microphyll Woodland in other references). These two vegetation types are described in Section 3.3 of the DEIS. There also are additional disturbed areas along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length. Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and creosote bush scrub on partially stabilized sand fields (Figure 5).

2.2 Structures and Facilities

2.2.1 Solar Facility

The proposed solar facility would consist of several main components, including the solar arrays, electrical infrastructure, an operations and maintenance (O&M) facility, either on or off-site, and security such as fencing and lighting. The solar arrays would cover the majority of the project area.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a "disc and roll" technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level; as well as "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 1,000 acres.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Access roads 14 to 20 feet wide would run east to west, and 14 foot wide roads would run north to south to allow fire and vehicular access for the maintenance of the electrical facilities.

Vegetation would be allowed to re-grow within the solar panel field. It would not be allowed to grow above 18 inches underneath the panels, to minimize attraction to wildlife, prevent fire hazard, and prevent disruption of panel performance.

O&M activities would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. The access roads would be maintained free from significant vegetation through the use of targeted herbicide application, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays. These activities are described in the Draft IWMP (DEIS Appendix C.10).

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be as long as 50 years. A Decommissioning and Reclamation Plan is now in preparation, to be implemented when permanent facility closure is appropriate. Closure strategies may include temporary "mothballing"; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and reclamation of the site to BLM-approved specifications. Fully decommissioning the site would involve removal and demolition of above and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

2.2.2 Gen-tie Line

The proposed gen-tie alignment is described here and in the EIS as Alternative B. The proposed alignment is shown on Figures 1 and 2. Typical spans between poles would be approximately 900 to 1,100 feet. Approximately 73 transmission structures would be built. Ground disturbance would also take place at splicing locations and other work sites during construction. Permanent access roads would be constructed to provide access for maintenance of the gen-tie, as needed. Permanent disturbance for gen-tie construction, O&M, and decommissioning would total approximately 92 acres.

Although the EIS conservatively assumes construction of the gen-tie line by enXco under non–cumulative conditions, enXco's proposed gen-tie line would be on a shared ROW with the approved DSSF gen-tie line under cumulative conditions, and would be constructed on the same poles. Stringing of enXco's gen-tie line would take place concurrently with construction of First Solar's gen-tie line if feasible, and would require no additional equipment, personnel, or time beyond that already required and approved for First Solar's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider.

If construction for both gen-tie conductors is concurrent, then DHSP gen-tie construction would result in no ground disturbance beyond areas to be disturbed for the approved DSSF. Any remediation, revegetation or reclamation of work sites would be completed according to requirements of the approved DSSF project.

If the DHSP gen-tie line is constructed on a different alignment (Alternatives C, D, or E as analyzed in the DEIS) or if the DHSP conductor stringing takes place on Alignment B after DSSF construction is completed, then enXco will implement gen-tie line revegetation as described in this Vegetation Resources Management Plan.

During gen-tie line construction, access roads and work areas at each structure location would be cleared and graded. Clearing and grading would also be needed for conductor pulling and tensioning sites and temporary guard structure sites at road or utility crossings. Laydown yards would all be within the project footprint and would not require any additional ground disturbance.

3.0 Applicable Mitigation Measures

This Vegetation Management Plan was prepared to ensure project compliance with Applicant Measures AM BIO-3 and AM BIO-5, and Mitigation Measure MM VEG-5, of the DHSP DEIS. Note that the DEIS adopts the Applicant Measures (indicated by the prefix AM) by incorporating them into project-specific mitigation measures (indicated by the prefix MM) as appropriate. Mitigation measures proposed in the DEIS encompass the substance and intent of the AMs, but clarify or expand on reporting requirements, timing of implementation, or other details where appropriate. Where there is a conflict between AMs and MMs the mitigation measures take precedence.

Applicant Proposed Measure and Mitigation Measure VEG-9 of the DEIS (both quoted in full, below) require the applicant to locate special-status plants intended for salvage, and to prepare and implement an IWMP. DEIS Mitigation Measure MM VEG-5 expands and clarifies those measures. DEIS Mitigation Measure MM VEG-7 identifies mitigation strategies for special-status plants that may be impacted by the project.

AM BIO-3: **Pre-construction Surveys for Special-Status Plant Species and Cacti.** Before construction, the Applicant will stake and flag the construction area boundaries, including the construction areas for the solar farm site and gen-tie line; construction laydown, parking, and work areas; and the boundaries of all temporary and permanent access roads. A BLM-approved biologist will then survey all areas of proposed ground disturbance for special-status plant species and cacti during the appropriate blooming period for those species having the potential to occur in the construction areas. All special-status plant species and cacti observed will be flagged for transplantation. All cacti observed will be flagged for transplantation and special-status plant species observed will be flagged for salvage.

AM BIO-5: **Vegetation Resources Management Plan.** The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components:

- A Vegetation Salvage Plan which discusses the methods that will be used to transplant cacti present within the project locations following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur in the project locations if feasible.
- A Restoration Plan which discusses the methods that will be used to restore Creosote Bush Scrub and Desert Dry Wash Woodland Habitat that is temporarily disturbed by construction activities.
- The Vegetation Salvage Plan and Restoration Plan will specify success criteria and performance standards. BLM will be responsible for reviewing and approving the plan and for ensuring that the Applicant implements the plan including maintenance and monitoring required in the plan.

MM VEG-5 **Prepare and Implement a Vegetation Resources Management Plan.** This mitigation measure provides further detail and specificity to the Pre-construction Surveys for Special-Status Plant Species and Cacti provided in AM BIO-3, and the Vegetation Resources Management Plan described in AM-BIO-5. The project Owner will contract a qualified botanist to prepare and implement a Vegetation Resources Management Plan, to be reviewed and approved by BLM, Riverside County, and the Resource Agencies. The Vegetation Resources Management Plan must be approved in writing prior to the initiation of any vegetation disturbing activities. The Plan's goal will be to prevent further degradation of disturbed sites, but not necessarily to restore pre-disturbance habitat values, due to off-site compensation requirements (MM VEG-6). The Vegetation Resources Management Plan will detail the methods for revegetation of temporarily impacted sites; salvage of cacti and special-status plants from the project footprint; and long-term management of vegetation within the solar facility during its operations. The Vegetation Resources Management Plan will include the following components:

1. **Reclamation, revegetation, or restoration of temporarily impacted sites.** Temporary project disturbances to soils and vegetation (e.g., staging areas, materials and equipment, lay-down areas, temporary work areas and access routes along the gen-tie line) are analyzed as long-term disturbance, and habitat compensation lands are required to mitigate those long-term impacts (MM VEG-6). In order to avoid further degradation of these sites, the project Owner will prepare and implement a plan to revegetate and restore the sites. The objectives will be to prevent or minimize further site degradation; stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions. The nature of site reclamation, revegetation, or restoration will vary according to each site, its pre-disturbance condition, and the nature of the construction disturbance (e.g., drive and crush, vs. blading).
2. **Implementation:** The Plan will include at minimum: (a) soil preparation measures, including locations of recontouring, decompacting, imprinting, or other treatments; (b) details for top soil storage, as applicable; (c) plant material collection and

acquisition guidelines, including guidelines for salvaging, storing, and handling plants from the project site, as well as obtaining plants from elsewhere; (d) a plan view drawing or schematic depicting the temporary disturbance areas (drawing of "typical" gen-tie structure sites will be appropriate); (e) time of year that the planting or seeding will occur and the methodology of the planting; (f) a description of the irrigation, if used; (g) a statement that the Integrated Weed Management Plan (MM VEG-9) will be implemented, or alternate measures to control invasive weeds, as appropriate; (h) success criteria; and (i) a detailed monitoring program, commensurate with the Plan's goals. This Plan will also contain contingency measures for failed revegetation and restoration efforts (efforts not meeting success criteria).

3. **Seed and Nursery Stock.** Only seed or potted nursery stock of locally occurring native species from a local source will be used for revegetation. Seeding and planting will be conducted as described in Chapter 5 of Rehabilitation of Disturbed Lands in California (Newton and Claassen 2003). The list of plants observed during botanical surveys of the project area will be used as a guide to site-specific plant selection for revegetation.
4. **Monitoring Requirement and Success Criteria.** The Plan will include objective success criteria, commensurate with the goals of the Plan. Monitoring of the reclamation, revegetation, or restoration sites will continue annually for 3 years or until the defined success criteria are achieved. The project Owner will be responsible for implementing remediation measures as needed. Following remediation work, the site will be subject to the success criteria and monitoring period as required for the initial reclamation, revegetation, or restoration.
5. **Cactus Salvage.** In conformance with BLM policy, the project Owner will include salvaged or nursery stock yucca (all species), and cacti (excluding cholla species, genus *Cylindropuntia*), in revegetation plans and implementation affecting BLM lands. The Plan will include methods to salvage and replant cacti, yucca, or other native species found on the site, prior to disturbance. It will include descriptions of pre-project field surveys to locate and identify specimens suitable for salvage; season for salvaging the plants; methods for salvage, storage, and re-planting them; locations for re-planting; and appropriate monitoring and success criteria for the salvage work.
6. **Operations Phase On-Site Vegetation Management:** The Plan will include methods and scheduling for on-site vegetation management throughout the operations phase, describing mowing or other vegetation treatments to be implemented, disposal of mown material, and incorporating all applicable components of the Integrated Weed Management Plan, including any proposed herbicide usage.
7. **Decommissioning Phase Plan Supplement.** Prior to closing and decommissioning the project, the project Owner will contract a qualified botanist to prepare a supplement to the Vegetation Resources Management Plan, to describe all proposed vegetation management activities, and to be consistent with the site's proposed reuse. The supplement will describe any proposed reclamation, revegetation, or restoration of the site, to be consistent with Section 1 of this

measure, above, as well as weed management and post-decommissioning monitoring requirements and success criteria.

8. **Reporting.** Within 90 days after completion of each year of project construction, the project Owner will provide to the BLM and Riverside County verification of the total vegetation acreage subject to temporary and permanent disturbance and a written report identifying which items of the Vegetation Resources Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction and decommissioning phases, and which items are still outstanding. The annual reports will also include a summary of the reclamation, revegetation, or restoration activities for the year, a discussion of whether performance standards for the year were met, any remedial actions conducted and recommendations for remedial action, if warranted, that are planned for the upcoming year.

MM VEG-7 **Mitigate Direct Impacts to Special-Status Plants.** This mitigation measure provides further detail and specificity to the Pre-construction Surveys for Special-Status Plant Species and Cacti provided in AM BIO-3. The project Owner will mitigate impacts to Emory's crucifixion thorn on the solar generator site and direct impacts to any other CRPR 2 ranked plants that may be impacted by gen-tie line construction, including plants that may be discovered during spring 2012 field surveys of gen-tie Alternative E, through one or a combination of the following strategies. No CRPR Rank 1 plants have been reported from the site or are expected to occur (Section 3.3) but if a CRPR Rank 1 species is located during future field work, the Designated Biologist will coordinate with BLM botanists to determine appropriate mitigation, commensurate with the measures described below.

1. Avoidance. Project design will avoid at minimum 75percent of the Emory's crucifixion thorn and other CRPR 2 ranked plants occurrences within the project boundaries or other work areas, including the gen-tie line, and will provide a minimum 250-foot buffer area surrounding each avoided occurrence, where no project activities will take place.

2. Off-site compensation. The project Owner will provide compensation lands consisting of occupied Emory's crucifixion thorn, or other CRPR 1 or 2 ranked plants, habitat at a 1:1 ratio for any occupied habitat affected by the project, according to the terms described in MM VEG-6. Occupied habitat will be calculate on the project site and on the compensation lands as including each special status plant occurrence and a surrounding 250-foot buffer area. Off-site compensation will be incorporated into the project's Habitat Compensation Plan, for review and approval by the BLM, Riverside County, and the Resource Agencies.

3. Salvage. It is not known whether salvage is a feasible mitigation strategy for Emory's crucifixion thorn or most other special-status plants. For Emory's crucifixion thorn, the project Owner will consult with Rancho Santa Ana Botanic Garden (RSABG) regarding the success of salvage efforts for this species at the Desert Sunlight Solar Farm Project site. If the strategy has been shown to be feasible, then the project Owner will prepare and implement an Emory's Crucifixion Thorn Salvage and Relocation Plan, to be reviewed and approved by the BLM, Riverside County EPD, and the Resource Agencies, prior to disturbance of any occupied Emory's crucifixion thorn habitat. The project Owner will contract with RSABG or another entity with comparable experience and qualifications, to salvage at minimum 75 percent of Emory's crucifixion thorn individuals from the proposed project site and transfer them to a suitable off-site location approved by BLM. If special-status plants are salvaged from non-BLM land, then all salvage planning and activities will be subject to review and approval by Riverside County EPD. For other special-status plants (i.e., on gen-tie Alternative E, if they occur), the project owner will consult with the BLM botanist and/or Riverside County (as applicable), along with RSABG or another qualified entity, to develop an appropriate experimental salvage and relocation strategy, based on the life history of the species affected. The Plan will include at minimum: (a) collection/salvage measures for plants or seed banks, to retain intact soil conditions and maximize success likelihood; (b) details regarding storage of plants or seed banks; (c) location of the proposed recipient site, and detailed site preparation and plant introduction techniques details for top soil storage, as applicable; (d); time of year that the salvage and replanting or seeding will occur and the methodology of the replanting; (e) a description of the irrigation, if used; (f) success criteria; and (g) a detailed monitoring program, commensurate with the Plan's goals.

4. Horticultural propagation and off-site introduction. If salvage and relocation is not believed to be feasible for Emory's crucifixion thorn or other special-status plants, then the project Owner will consult with RSABG or another qualified entity, to develop an appropriate experimental propagation and relocation strategy, based on the life history of the species affected. The Plan will include at minimum: (a) collection/salvage measures for plant materials or seed banks, to retain intact soil conditions and maximize success likelihood; (b) details regarding storage of plant, plant materials, or seed banks; (c) location of the proposed propagation facility, and proposed methods; (d); time of year that the salvage and other practices will occur; (e) success criteria; and (f) a detailed monitoring program, commensurate with the Plan's goals.

4.0 Cactus and Special-Status Plant Salvage

4.1 Pre-Construction Survey

Prior to any grading or clearing activity, any given work site (including the entire solar facility site; gen-tie line work areas; all construction laydown, parking, and work areas; and all temporary and permanent access roads) will be surveyed by qualified biologists for several special-status biological resources, in conformance with several mitigation measures in Sections 4.3 and 4.4 of the DEIS. These pre-construction clearance surveys will be completed prior to any ground-disturbing activity, including fence construction or any grading or clearing for small parking or logistics sites. For any off-road vehicle access to the project area before pre-construction clearance surveys (e.g., for survey staking or soil testing), a biological monitor will accompany the vehicle to ensure that no special-status biological resources are disturbed. During all pre-construction clearance surveys, any special-status plants or cactus (excluding cholla species) located will be flagged and their locations will be recorded using hand-held GPS units. These plants will be either salvaged from the site or, if specific work areas can be adjusted, the sites and a suitable buffer area will be avoided. The project's Designated Biologist will be responsible for determining the buffer distance, flagging the avoidance area, and maintaining and inspecting the location throughout the construction phase of the project.

In addition to cacti, the project owner will be responsible for flagging all CRPR 1 and 2 plants located within the project area. One or more qualified botanists will conduct pre-construction surveys throughout all areas to be disturbed, either concurrently with the wildlife crew(s) or during separate survey(s). Survey season requirements are summarized in Table 1. All cacti and Emory's crucifixion thorn (*Castela emoryi*) can be identified year-around. No other CRPR 1 or 2 ranked species are known from the proposed solar facility site, though one CRPR 1B species, Harwood's woollystar, was reported on the gen-tie alignment Alternative E (Aspen 2012).

The analysis of impacts to special-status plants in Section 4.3.7 of the DEIS recommends mitigation for plants ranked as CRPR 1 and 2, but that salvage or other mitigation for CRPR 3 and 4 plants is not warranted. Based on those recommendations, and on the DEIS statement that "Where there is a conflict between AMs and MMs the mitigation measures take precedence," enXco does not propose to salvage CRPR 3 or 4 plants from the solar facility site or gen-tie alignment work areas.

Table 1: Pre-construction cactus and special-status plant survey schedule

Species	Pre-construction survey season	Locations
Cacti (excluding cholla species)	Year-around	All disturbance areas
Emery's crucifixion thorn	Year-around	Mapped locations (BLM 2012)
Harwood's woollystar	Spring	Dune habitat, Alternative E only (Aspen 2012)

4.2 Replanting Locations

All salvaged plants will be transplanted onto BLM lands within the project's ROW grant, adjacent to and as near as is feasible to the salvage locations, within the gen-tie ROW. Planting sites may be in revegetation areas on temporarily disturbed work sites, or elsewhere on the ROW, away from disturbance sites.

4.3 Cactus Salvage

BLM policy and the DEIS mitigation measures cited above require salvage and transplantation of *Yucca* and most cacti, but not cholla cacti. No *Yucca* species (e.g., Joshua tree, or Mojave yucca) were located on the project site, and enXco does not anticipate any need to salvage or relocate *Yuccas.* Excluding cholla species, three cactus species were located on the DHSP solar facility site or on the proposed or alternative gen-tie alignments. These are: California barrel cactus (*Ferocactus cylindraceus*), fish-hook cactus (*Mamillaria tetrancistra*), and beavertail cactus (*Opuntia basilaris* var. *basilaris*) (BLM 2012, Appendix C.6). All three were scarce in their respective habitats. Fish-hook cactus was located only on gen-tie alternative alignment E, but not on the proposed solar facility site. In addition, foxtail cactus (*Coryphantha vivipara*), cottontop cactus (*Echinocactus polycephalus*), and hedgehog cactus (*Echinocereus engelmannii*) were reported within the study area described in the DSSF FEIS (BLM 2011a, Appendix H). Any of these cactus species could be found on the DHSP solar facility site or gen-tie alignment during pre-construction clearance surveys and, if found, will be salvaged for relocation according to the following methods.

4.3.1 Cactus Salvage Procedure

No large cacti (excluding cholla species) have been located on the site. Therefore, cactus salvage will be completed using hand tools, without need for tractors or other specialized equipment. Access and transport will be via pickup truck, SUV, or a similar vehicle. The work crew will drive on existing roads as near as possible to each recorded cactus location. Depending on distance or other logistics, the crew may drive off-road to the cactus location, only with biological monitoring as needed to ensure that no special-status resources of any kind are disturbed by driving. The cactus will be salvaged as follows:

1. To the extent feasible, cactus plants will be salvaged during fall or winter to minimize transplantation stress during the early spring active growth season, or during extreme summer heat.
2. The north-facing side of each plant will be marked by securely tying a tag or colored flagging to the spines. In addition, each plant will be assigned a unique identification number, also affixed to the plant.
3. For each salvaged plant, a brief plant-specific description and microsite description will be recorded, including short descriptions of root depth, depth of the stem in the soil, topography, hydrology, shade, and soil texture at the salvage site.
4. Each plant will be dug out carefully, to avoid root damage. Salvage crews will begin digging no closer than 6 inches to the base of the plant, and farther from the base, depending on plant size.
5. The cacti will be carefully excavated with a shovel just below the root depth of the plant, generally 4 to 8 inches below the soil surface.
6. The plants will be lifted out with a shovel, heavy gloves, or other equipment as needed to avoid damaging the plants.
7. Any damaged roots will be trimmed, using scissors or a knife disinfected in a 10 percent bleach solution. Undamaged roots will not be trimmed. Cutting tools will be disinfected prior to trimming any individual plant's roots.
8. Fungicide or sulfur will be applied to roots to decrease the risk of infection and to improve callusing.
9. Roots will be allowed to dry (or callus) for 3 days to 2 weeks. They will be held within a shade structure and protected from overheating or strong wind during the callus period.
10. Following the root callus period, cacti will be transported to the replanting location and replanted. Cacti salvaged during spring or summer may be held over in the shade structure and protected from wind and heat until fall for transplantation.

4.3.2 Cactus Planting and Maintenance

Specific replanting relocations will be identified within the gen-tie ROW, away from any disturbance areas (above). Each cactus will be replanted in a microsite selected to resemble its salvage site, as described in the plant-specific notes (above). The location of each planting will be recorded with a hand-held GPS unit. Cacti will be replanted in the same north-orientation as marked on each plant. They will be planted in holes somewhat deeper than the original root system, and the remaining roots will be spread across the bottom of the hole. Soil will be replaced over the roots, so that the plant itself is held in place at its original stem soil depth. Soil will be tamped around the plant so that there are no air pockets around the roots, and formed into a small basin to hold irrigation or rainwater. If cacti must be planted during spring or summer, shade structures or "vertical mulch" (branches cleared from the work sites) will be provided as shelter from sun and wind. The plants will be well watered when they are planted, and watering will continue regularly for 60 days following the planting, to allow new root systems to develop. The watering schedule will be based on planting season and natural rainfall (if any). Plants salvaged and transplanted during fall or winter (as recommended) will be watered weekly over a 60-day period to facilitate their establishment and survival. If plants must be transplanted in spring (while they are metabolically active), the watering schedule will be weekly at minimum, and it will be adjusted according to temperature and rainfall (if any). For cacti planted during summer, watering may be postponed until the following fall to avoid overwatering during the dormant season. Following the establishment period, transplanted cacti may be watered regularly during normal rainfall seasons for the area (i.e., August through April) at reduced frequency to facilitate establishment and growth, for a period of two years. The irrigation schedule will vary according to natural rainfall. If natural rainfall is well above average, then no irrigation will be necessary. If natural rainfall is average or below average, then irrigation will be scheduled to mimic a year of above-average rainfall. Irrigation may use any appropriate method, either by directly watering the plants by hand or by using methods described by Bainbridge (2007).

Table 2. Cactus salvage, planting, and maintenance schedule.

Salvage Season	Transplantation Season	Watering and Maintenance
Fall or winter (preferred)	Fall or winter	Weekly for 60 days; regular (to mimic high-rainfall patterns) for up to 2 years
Spring	Spring	Weekly for 60 days; regular (to mimic high-rainfall patterns) for up to 2 years
Summer	Summer or hold until following fall	Planting date and irrigation to be determined, based on professional opinion of the designated biologist

4.3.3 Cactus Salvage Success Criteria and Monitoring

Transplanted cacti will be monitored at least monthly through the first three months following transplantation to record qualitative observations including survival, any need for additional water, shade, wind shelter, or protection from animals or erosion. Overall survival and any monitoring recommendations will be recorded at each monitoring visit and submitted to the Designated Biologist for inclusion in annual monitoring reports. Following the three-month period, monitoring visits may be reduced to quarterly for 3 years.

The cactus transplantation success criterion will be 75 percent survival after 3 years. If this criterion is not met, then the project owner will implement one of the measures below, as remediation:

- Plant additional cacti or other salvaged plants from an off-site location in the Chuckwalla Valley, if such plants become available through another project (including renewable energy projects or any other project on private or public land that may cause removal of cacti). The additional plantings will offset any discrepancy between 3-year monitoring results and success criteria at a 2:1 ratio.

- Increase native vegetation cover and diversity at one or more temporary disturbance site. The enhanced cover and diversity standard will apply to one acre of revegetation area for each 5 percent shortfall from the 3-year success criteria.

4.4 Special-Status Plant Salvage

No listed threatened or endangered species, and no BLM-designated sensitive species, were located on the site during BLM-protocol botanical surveys conducted in 2010 and 2011 (BLM 2012), or on the gen-tie alignment Alternatives B, C, or D (BLM 2011a). Emory's crucifixion thorn is the only special-status plant meeting the DEIS criteria for salvage or other mitigation that has been located on the project site. In addition, Alternative gen-tie alignment E supports several special-status plants of aeolian sand habitat, including Harwood's woollystar (CRPR 1B). These are annual species not suitable for translocation, but probably suitable for seed salvage and either replanting or long-term seed banking. The project owner will implement an experimental salvage effort for any CRPR 1 or 2 species found during pre-construction surveys (Section 4.1, above), recognizing that probability of success is unknown. There will be no quantitative success criteria for the experimental salvage program. However, monitoring data will be provided to the BLM and other resource agencies to help inform future mitigation planning for these species. The project owner will contact Rancho Santa Ana Botanic Garden (RSABG) to develop salvage plans for any of these species, in coordination with BLM and other resource agencies.

The analysis of impacts to special-status plants in Section 4.3.7 of the DEIS recommends mitigation for plants ranked as CRPR 1 and 2, but that salvage or other mitigation for CRPR 3 and 4 plants is not warranted. Based on those recommendations, enXco will salvage or implement other measures for the following plants that may be located on the solar facility site or gen-tie alignment work areas.

- Emory's crucifixion thorn. enXco understands that RSABG salvaged Emory's crucifixion thorn specimens from the Desert Sunrise project site, and enXco will implement similar measures on the DHSP site.
- Aeolian sand species. If gen-tie Alternative E is authorized, and if Harwood's woollystar or any other CRPR 1 or 2 ranked species are located at work sites along the alignment, then enXco will work with RSABG to salvage seed or surface soil containing seed, for transfer to RSABG's curated collection or to suitable locations in the gen-tie ROW.

5.0 Reclamation / Revegetation

The temporary impacts of some construction work (e.g., at gen-tie tower sites, and throughout the solar facility, after panels are installed) are analyzed as long-term impacts to vegetation and habitat in the DEIS. The DHSP's long-term and permanent impacts to native vegetation and habitat will be mitigated mainly through off-site acquisition and preservation of habitat. The goal of this reclamation / revegetation effort will be to prevent further degradation of disturbed sites, but not to restore pre-disturbance habitat values. The temporary disturbance sites will be revegetated to stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions, according to Mitigation Measure VEG-5. This section of the Vegetation Resources Management Plan conforms to those requirements.

The project owner will contract with a qualified Reclamation Specialist to evaluate and prescribe specific reclamation measures at each work site. The Reclamation Specialist will coordinate with the project Designated Biologist and with the project owner to ensure that the prescriptions are implemented as written.

5.1 Site Preparation

enXco does not anticipate substantial grading or soil removal at any temporary disturbance site. Therefore, this Plan does not include measures for topsoil salvage, storage, or replacement. Temporary disturbance will generally result from "disc and roll," "micrograding," isolated "cut and fill and roll," or "scarifying" work areas (blading without substantial soil movement). In some cases, disturbance may consist of simply crushing vegetation in place and driving over the work area. These site treatments will cause soil compaction and either degradation or elimination of native vegetation.

Site preparation measures prior to reclamation work will be determined on a site-by-site basis, based on the advantages and disadvantages of soil treatment or site preparation methods to restore natural contours, protect the site from erosion damage by wind or water, and maximize likelihood of vegetation recovery.

Soil decompaction can increase soil vulnerability to weeds or erosion, increase dust, or cause further damage to surviving rootstocks that may be present. The Reclamation Specialist will evaluate soil compaction and prescribe either no treatment, limited treatment using hand tools, light harrowing or disking with a tractor, or deeper disking or ripping, depending on specific circumstances. Where soil decompaction is implemented, follow-up measures to control dust and erosion will also be prescribed.

Where construction disturbance causes alterations to natural channel morphology or runoff patterns, the Reclamation Specialist will prescribe recontouring or other measures such as hay bales, straw wattles, or other erosion control materials. Consistent with the Integrated Weed Management Plan, any such materials to be used at any project work site shall be certified weed free.

Where feasible, mulch used for erosion control will be produced from native vegetation cleared from the site itself. The Reclamation Specialist may recommend stockpiling the vegetation removed during construction, for replacement onto the site either as crushed mulch, or as "vertical mulch" to reduce sun and wind exposure to the soil surface and germinating plants. enXco anticipates that the temporary disturbance sites will be too small to warrant soil imprinting (e.g., at gen-tie structures) or inaccessible to equipment (temporary disturbance within the solar field).

5.2 Plant Materials

enXco may re-seed temporarily disturbed areas with a native seed mix. The determination whether to re-seed and, if so, seeding rates (i.e., pounds per acre) will be made by the Reclamation Specialist, based on the nature of disturbance and condition of soils and evidence (if any) of re-sprouting from remaining rootstocks. The seed mix will consist primarily or exclusively of native early-successional species, listed below. There will be no re-seeding on sites where construction-phase vegetation and soil disturbance are limited by mowing or to "drive and crush," unless these areas show inadequate natural recovery (e.g., re-sprouting rootstocks) or excessive soil compaction that may inhibit seed germination (see site preparation, above).

enXco will arrange for adequate seed supplies well in advance of scheduled seeding for each temporarily disturbed site. Due to the unpredictable rainfall and drought conditions throughout the Sonoran Desert region, seed cannot be reliably collected or acquired in any given year. Immediately following the Notice to Proceed, the Reclamation Specialist or Designated Biologist will estimate the total number of acres to be reseeded, and determine quantities of seed needed. enXco will collect seed, or will contract with suppliers or collectors, to acquire and store enough seed for all projected reseeding work. The

Reclamation Specialist will be responsible for maintaining a seed inventory, based on the sample format shown in Table 3.

Table 3. Sample seed inventory management format.

Species (Latin and common names)	On hand (lb.)	On order (lb.)	Quantity needed for upcoming years (lb.)				
			Year 1	Year 2	Year 3	Year 4	Year 5

The seed mix will consist of the following species, all of which are characteristic early-successional species in the Sonoran desert.

- Desert needlegrass (Stipa [Achnatherum] speciosa)
- Brittlebush (Encelia farinosa)
- Cheesebush (Hymenoclea [Ambrosia] salsola)
- Burrobush (Ambrosia dumosa)

Total seeding rate will be no less than 20 pounds per acre. Specific proportions will be based upon seed availability and recommendations of the Reclamation Specialist. Depending on seed availability, other native species occurring on the site or nearby at similar exposure and elevation may be selected to replace those above. Any plant material used in revegetation must be locally native, and must occur on or near the project site. All seed to be used in revegetation will originate from the Sonoran Desert region of California, between approximately sea level and 2,500 feet elevation. Any seed from vendors or contracted collectors will be certified weed free. The project owner may collect seed on-site from project areas to be mown or graded. The collection of adequate seed supplies will likely necessitate repeated visits to any given collection area, depending on seasonality and annual productivity of the target plants. If seed is purchased from a vendor or contract seed collector, enXco will require the supplier to provide location and elevation for each seed lot, and will not purchase or use seed originating outside these geographic and elevational bounds. The project owner will be responsible for acquiring adequate seed to implement this plan. Seed collections by the project owner or its contractors or vendors will be made according to the following guidelines.

- Seed collection from plants to be removed or mown for project construction will be unrestricted.

- No seed will be collected from designated Wilderness Areas, DWMAs, WHMAs, or critical habitat, except within any approved project disturbance areas (i.e., gen-tie work sites or the 47-acre WHMA area within the solar facility site).
- Any seed collection on public lands will be done only under authorization from the BLM.
- No more than 40 percent of seeding plants in any collection area (excluding project disturbance areas) will be harvested. No more than 10 percent of mature seed on any single plant will be harvested.
- Access to collection areas will be via open, designated routes, or on foot; there will be no cross-county vehicle travel.
- Collectors will record and track seed lots, including collection date, collection location, elevation, dominant species at location, stand conditions, test data, bulk weight, and net weight (as pure live seed).

5.3 Seeding Methods And Schedule

The DHSP's temporary disturbance areas will generally be small, or inaccessible to equipment (such as seed drill or hydroseeding equipment). Therefore, seed will be broadcast using manually operated cyclone-type bucket spreaders, mechanical seed spreaders, blowers, or rubber-tired all-terrain vehicles equipped with mechanical broadcast spreaders. Seed in the spreader hoppers will be mixed to discourage separation of the component seed types. Where broadcast seeding is employed, seeded areas may be raked or harrowed to cover the seed, at the direction of the project Reclamation Specialist.

Re-seeding will be scheduled to minimize potential seed loss to granivorous birds and small mammals and maximize exposure to seasonal rainfall. Seeding will be done in late summer or early fall, to ensure that seed is in place prior to the onset of seasonal rain in late fall or early winter. Later seeding is likely to result in failed germination due to inadequate moisture availability.

Due to the arid climate and variable rainfall, germination and establishment success of seeded plants is not predictable. Low germination success in the first year following re-seeding may be consistent with the goal of this plan (i.e., to prevent or minimize further site degradation) during dry years, when erosion and weed cover are not problematic. However, enXco may need to take additional measures to minimize dust generation from sites where adequate plant cover does not re-establish (see monitoring and remediation measures below).

5.4 Reclamation / Revegetation Site Maintenance

Reclamation and revegetation sites will not be irrigated. The sites will be monitored for weed presence and abundance, and weed control will be implemented as needed, according to the project Integrated Weed Management Plan. Additional maintenance activities will consist of erosion control, soil stabilization, or other measures as needed, to be based on the results of monitoring.

5.5 Success Criteria

If the following success criteria have not been met within three years of project construction, the project owner will be responsible for implementing remediation measures as needed. Following remediation work, the site will be subject to the success criteria and monitoring period as required for the initial reclamation, revegetation, or restoration.

1. At temporarily disturbed areas treated by drive and crush or similar disturbance, at least 80 percent of the species observed within the area will be native species that naturally occur in local desert scrub habitats.
2. At temporarily disturbed areas treated by grading or scarification, so that native soils and rootstocks were lost, at least 60 percent of the species observed within the area will be native species that naturally occur in local desert scrub habitats.
3. Cover and density of non-native plant species within the temporarily disturbed areas will be no more than twice (2x) their cover and density in comparable adjacent lands that have not been disturbed by the project.
4. Soil stability and potential for erosion or dust source will be comparable to adjacent lands that have not been disturbed by the project.

5.6 Monitoring, Remediation, and Reporting

Following implementation of reclamation or revegetation measures, each temporarily disturbed site will be monitored annually to evaluate success, in terms of the success criteria above. Monitoring will continue for a period of no less than two years or until the defined success criteria are achieved. Remediation activities (such as additional planting, removal of non-native invasive species, or erosion control) will be taken during the 2-year period if necessary to ensure the success of the reclamation effort. If the mitigation fails to meet the established performance criteria after the 2-year maintenance and monitoring period, monitoring and remedial activities will extend beyond the 2-year period until the criteria are met.

If a fire or flood damages a reclamation site within the 2-year monitoring period, the project owner will be responsible for a one-time replacement. If a second fire or flood occurs, no replanting will be required, unless the damage is caused by the project owner's activity (as determined by BLM or other firefighting agency investigation).

Throughout the construction, operation, and decommissioning phases, and for a minimum of 3 years following completion of decommissioning, the Designated Biologist and Reclamation Specialist will be responsible for providing annual Vegetation Management Progress Reports to the BLM, CDFG, USFWS, and JTNP for review and approval. Each annual report will include the following contents:

- Brief summary of project construction, O&M, or decommissioning status, with a list of all temporarily disturbed sites treated or monitored during the preceding year
- Summary of reclamation or revegetation progress and results since previous report, including a map of all reclamation or revegetation activity since previous report.
- Seed inventory: accounting of materials acquired or used since previous report; and materials needed for coming 5 year period.
- Monitoring results: Summarize monitoring results and completion status for all sites.
- Recommendations as applicable for remedial work such as reseeding, erosion control, weed control, or other maintenance activity.
- Representative site photographs.
- Notation of any other pertinent concerns (e.g., vehicle trespass, etc.).

6.0 Operations and Decommissioning Phases

Throughout the operations and maintenance phase, on-site vegetation management will consist of vegetation control (e.g., mowing) to maintain shrub height below 18 inches in order to prevent interference with solar panels, minimize fire hazard, and minimize wildlife attraction. The Designated Biologist will inspect vegetation throughout the project area and along the gen-tie line annually to identify hazardous vegetation or barren areas that may be susceptible to erosion or other damage. All mown or cut plant material will be collected and transported to a licensed solid waste or composting facility. Weed control during the project O&M phase will be conducted as described in the Integrated Weed Management Plan. Vegetation management during project decommissioning will be completed according to the Closure and Reclamation Plan, to be provided separately.

7.0 Designated Biologist and Reclamation Specialist Responsibilities

7.1 Designated Biologist

The Designated Biologist, to be designated by the project owner (per Mitigation Measure MM-Veg-1) will be responsible for managing and implementing this Vegetation Resources Management Plan, as follows:

- Ensure that no off-road vehicle access occurs on the site until pre-construction surveys and special-status plant salvage, desert tortoise clearance, and other special-status species clearance or exclusion, have been completed;
- Ensure that no off-road vehicle access occurs off-site for seed collection or other project-related activities, except as specifically authorized according to final BLM project authorization;
- Scheduling all pre-construction clearance surveys for all project components, to include seasonal surveys for all special-status plants in the areas where they have been previously documented;
- Ensuring that each person assigned to survey, salvage, transplantation, seed collection, reseeding, monitoring, or any other aspect of this Plan is qualified for each task; for example, botanists conducting pre-construction surveys and seed collection must be qualified in locating and identifying plants of the area; workers responsible for salvage, transplantation, seeding, and maintenance must be qualified in nursery or landscaping practice;
- For special-status plant locations to be avoided by adjusting work area, the Designated Biologist will designate and mark a buffer area surrounding the location and will be responsible for monitoring the site throughout the construction phase of the project;
- Review the qualifications and recommendations of the contracted Reclamation Specialist, and support coordination among the Reclamation Specialist, resource agencies, and project owner.
- Review plans and recommendations made by the Reclamation Specialist;
- Review planting materials, erosion control materials, and other materials to ensure weed-free certification;
- Communicating with the project owner and resource agencies regarding reclamation and revegetation activities;

- Coordinating reclamation activities with other project activities including construction and maintenance work as well as mitigation and compliance requirements such as implementing the Integrated Weed Management Plan;
- Annual O&M phase inspection to identify accumulated dead vegetation, wildlife attractants, barren soils or other areas susceptible to erosion or likely dust sources; coordinate with Reclamation Specialist to implement site treatment as needed
- Prepare and submitting monitoring reports.

7.2 Reclamation Specialist

The Reclamation Specialist, to be designated by the project owner in coordination with the Designated Biologist, will be responsible for site-specific reclamation activities and for supporting the Designated Biologist in managing and implementing this Vegetation Resources Management Plan, as follows:

- Review all temporary disturbance sites to evaluate soil compaction, vegetation condition, susceptibility to erosion, weed invasion, or as dust sources, and specify site-specific treatments such as erosion control, soil treatment, decompaction, mulch application, or reseeding for each site;
- During O&M phase, review barren soils or other areas identified by the Designated Biologist to evaluate soil compaction, vegetation condition, susceptibility to erosion, weed invasion, or as dust sources, and specify site-specific treatments such as erosion control, soil treatment, decompaction, mulch application, or reseeding for each site;
- Estimate overall project seed requirements; update estimates as needed; and coordinate with the Designated Biologist and project owner to obtain and maintain seed inventory;
- Oversee and manage site treatments, including soils, erosion control, reseeding, and other requirements;
- Oversee monitoring and evaluate success at each reclamation or revegetation site;
- Plan and direct follow-up remedial work as needed to meet success criteria;
- Prepare and submit annual reports to the project owner and resource agencies in coordination with the Designated Biologist.

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Appendix C.18

Closure and Reclamation Plan

Draft Closure and Reclamation Plan
Desert Harvest Solar Project

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Abbreviations and Acronyms

BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
DHSP	Desert Harvest Solar Project
DSSF	Desert Sunlight Solar Farm
DWMA	Desert Wildlife Management Area
EIS	Environmental Impact Statement
JTNP	Joshua Tree National Park
NEPA	National Environmental Policy Act
ROW	Right-of-Way
WHMA	Wildlife Habitat Management Area
WRCC	Western Regional Climate Center

1.0 Introduction

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 5 miles north of Desert Center, California. The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2012).

This Closure and Reclamation Plan was prepared as an appendix to the DHSP Environmental Impact Statement (EIS). It describes enXco's reclamation strategy for the project area after closure of the solar generating facility. This reclamation strategy is intended to minimize adverse long-term effects to native vegetation, soils, and habitat, while recognizing that the primary mitigation for these impacts is the acquisition and long-term protection of off-site vegetation and habitat, described in Mitigation Measure MM VEG-6 of the DEIS (BLM 2012). This plan addresses the revegetation of sites to be disturbed for the life of the project. Reclamation and revegetation of areas to be temporarily disturbed during construction activities are addressed in a separate Vegetation Resources Management Plan (VRMP; Aspen 2012a). In addition, invasive weeds in the project area will be controlled throughout the life of the project according to the DHSP Integrated Weed Management Plan (IWMP; Appendix C.9 of the DEIS). This plan supplements both the VRMP and IWMP. Together, they describe the overall approach to vegetation management, weed management, and site closure and reclamation to be implemented over the life of the DHSP.

The objective of project decommissioning and reclamation is to remove the installed power generation equipment and return the site to a condition that would maximize vegetation recovery over time. The disturbance sites will be revegetated to stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions.

Most of the project's disturbance will be within the solar facility site; disturbed areas include access roads and other project facilities, summarized below and described in Chapter 2 of the EIS. enXco's proposed generator transmission line (gen-tie line) to the Red Bluff Substation would be constructed on poles shared with the Desert Sunlight Solar Farm (DSSF) gen-tie line. For purposes of environmental impact review, the Desert Harvest EIS conservatively assumes the enXco would construct the entire gen-tie line under non-cumulative conditions, but would share the poles of the DSSF gen-tie line under cumulative conditions. The DSSF Project, now under construction, is located to the immediate north of the DHSP site (Figures 1 and 2). The DSSF was approved in August 2011 (BLM 2011a; 2011b) and will occupy 3,761 acres when completed.

2.0 Project Description

2.1 Site Location

The DHSP site is located in the upper Chuckwalla Valley, on public lands administered by the BLM in unincorporated Riverside County, approximately 5 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way (ROW) Application consists of two non-contiguous parcels (Figures 1 and 2). The total solar facility project area is 1,208 acres, consisting of 1,053 acres in the larger parcel, and 155 acres in the smaller one. The DEIS analyzes 4 solar project alternatives, including the proposed project, and 4 gen-tie line alternatives. This section of the Closure and Reclamation Plan briefly summarizes the proposed project and the alternatives.

The site is undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. Public lands to the west of Kaiser Road, west of the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford Wildlife Habitat Management Area (WHMA), also designated in the NECO, is generally east of the site, but 47 acres of the WHMA are within the project site (see Figure 3). Some of the private lands to the south and west have been developed as residential and agricultural lands uses. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Two vegetation types cover the proposed solar facility site and generator tie-line Alternatives B, C, and D (Figures 4 and 5): Creosote Bush Scrub and Blue Palo Verde-Ironwood Woodland (also described as Desert Dry Wash Woodland or as Microphyll Woodland in other references). These two vegetation types are described in Section 3.3 of the EIS. There also are additional disturbed areas along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length. Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and creosote bush scrub on partially stabilized sand fields (Figure 5). These vegetation types are also described in Section 3.3 of the EIS.

2.2 Structures and Facilities

Solar Facility

The proposed solar facility would consist of several main components, including solar PV arrays, electrical infrastructure, an operations and maintenance (O&M) facility, either on- or off-site, and security such as fencing and lighting. The solar PV arrays would cover the majority of the project area.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a "disc and roll" technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level; as well as "micrograding" or "isolated cut and fill and roll" of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 1,000 acres.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Access roads 14 to 20 feet wide would run east to west, and 14 foot wide roads would run north to south to allow fire and vehicular access for the maintenance of the electrical facilities.

Vegetation would be allowed to re-grow within the solar panel field. It would not be allowed to grow above 18 inches underneath the panels, to minimize attraction to wildlife, prevent fire hazard, and prevent disruption of panel performance.

O&M activities would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. The access roads would be maintained free from significant vegetation through the use of targeted herbicide application, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays. These activities are described in the Draft IWMP (DEIS Appendix C.10).

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be longer. Closure strategies may include temporary "mothballing"; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and reclamation of the site to BLM-approved specifications. This Closure and Reclamation Plan is based on the presumption that the site would be fully decommissioned, including removal and demolition of above and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

Gen-tie Line

The proposed gen-tie alignment is described here and in the EIS as Alternative B. The proposed alignment is shown on Figures 1 and 2. Typical spans between poles would be approximately 900 to 1,100 feet. Approximately 73 transmission structures would be built. Ground disturbance would also take place at splicing locations and other work sites during construction. Permanent access roads would be constructed to provide access for maintenance of the gen-tie, as needed. Permanent disturbance for gen-tie construction, O&M, and decommissioning would total approximately 92 acres.

Although the EIS conservatively assumes construction of the gen-tie line by enXco under non–cumulative conditions, enXco's proposed gen-tie line would be on a shared ROW with the approved DSSF gen-tie line under cumulative conditions, and would be constructed on the same poles. Stringing of enXco's gen-tie line would take place concurrently with construction of First Solar's gen-tie line if feasible, and would require no additional equipment, personnel, or time beyond that already required and approved for First Solar's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider.

If decommissioning for both gen-tie conductors is concurrent, then DHSP gen-tie construction would result in no ground disturbance beyond areas to be disturbed for the approved DSSF. Any remediation, revegetation or reclamation of work sites would be completed according to requirements of the approved DSSF project. If the DHSP gen-tie line is constructed on a different alignment (Alternatives C, D, or E as analyzed in the EIS) or if the DHSP gen-tie conductors are decommissioned separately from the DSSF gen-tie, then enXco will implement reclamation and revegetation as described in this Closure and Decommissioning Plan.

3.0 Existing Site Conditions

3.1 Surrounding Land Uses

The area in the immediate vicinity of the Project site is largely vacant and undeveloped. The existing development in the surrounding area includes the rural community of Desert Center, California; Lake Tamarisk Desert Resort; the Eagle Mountain Mine; and DSSF, an approved neighboring solar project currently under construction. Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site.

3.2 Topography

The proposed solar facility site is on the bajada downslope from Eagle Mountains and Coxcomb Mountains, at approximately 600 feet elevation. The northwestern Chuckwalla Valley is a broad alluvial (water transported) system, fed by numerous alluvial fans higher in the watershed. This system flows east and southeast across the site, as a series of many small, braided drainage channels. The site is within a closed basin draining to Palen Dry Lake. The DHSP site is located within the Hayfield Planning Area of the Colorado River Basin region (Colorado River Basin RWQCB, 2006).

3.3 Climate

The Sonoran (or Colorado) Desert has a typical desert climate, having extreme daily temperature changes, low annual precipitation, strong seasonal winds, and mostly clear skies. The Colorado Desert experiences more summer precipitation than the northern deserts, and although annual precipitation is low overall, a substantial portion of it falls during August and September, usually as brief and intense thunderstorms. Average annual rainfall recorded at the Eagle Mountain weather station (Station No. 042598), located approximately 2.5 miles west of the solar facility site, is 3.68 inches (9.35 cm; WRCC, 2012). Average daily summer high temperatures are above 100 degrees Fahrenheit and average daily winter low temperatures are in the 40s.

3.4 Soils

The DHSP site has not been surveyed by the Natural Resource Conservation Service. Therefore, interpretation of soils on the DHSP site are based on field observations and on soils descriptions from the DSSF project, just north of the DHSP site. That analysis included a 2009 geotechnical study (BLM, 2011a). It found that soils were generally uniform and sandy in texture. Soils encountered during the DSSF geotechnical survey of the surrounding area consist of sand dune deposit, younger alluvium, and older alluvium. The older alluvium was slightly moist, likely due to winter rain infiltration and in a medium dense to dense condition, while the sand dune deposits were generally soft and dry (BLM, 2011a). Soils in the 2009 geotechnical study exhibited low to very severe resistivity and were classified as having a very low expansion potential (BLM, 2011). Soil textures and vegetation cover are similar on the DHSP site (BLM, 2012). The DHSP site also contains desert pavement (BLM, 2012). Desert pavements are areas with rock fragments of pebble to cobble size that cover an underlying layer of sand, silt, or clay. Desert pavement areas typically have little or no vegetation cover. The extent to which desert pavement reduces wind erosion and resulting fugitive dust depends on the density of the rock fragments covering the underlying soil.

3.5 Vegetation

Aspen biologists mapped vegetation on the Project site during September and October 2011. Two vegetation types cover the Project site (Figure 3): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde–Ironwood Woodland (*Parkinsonia floridum–Olneya tesota* Woodland Alliance) as described in Sawyer et al., 2009. The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo Verde–Ironwood Woodland is a subset of Holland's description of "Desert Dry Wash Woodland." There are small areas where natural vegetation has been removed or disturbed for roads and other land uses.

Creosote Bush Scrub (Bajada/Alluvial Landforms)

The Creosote Bush Scrub on the solar facility site is characterized by low diversity of shrub species with relatively wide spacing of shrubs and usually bare ground between the shrubs. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta grass (*Pleuraphis rigida*). This vegetation type also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil's spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory's rock daisy (*Perityle emoryi*).

Blue Palo Verde–Ironwood Woodland (Dry Wash Landforms)

Blue Palo Verde–Ironwood Woodland occurs throughout the Project area, primarily in dry washes. This vegetation type is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia floridum*). Additional tree species such as smoketree (*Psorothamnus spinosus*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. Blue Palo Verde-Ironwood Woodland is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland, 1986; Schoenherr and Burk, 2007). Vegetation in desert washes are generally taller, up to approximately 9 meters (30 feet) in height, and denser than those of surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer, 1988). Understory vegetation within these woodlands is composed of species such as big galleta grass, cheesebush (*Ambrosia salsola*), and desert lavender (*Hyptis emoryi*). Blue Palo Verde–Ironwood Woodlands on the site match the Desert Wash wildlife habitat described by Laudenslayer (1988).

The temporary impacts of some construction work (e.g., at gen-tie tower sites and throughout the solar facility, after panels are installed) are analyzed as long-term impacts to vegetation and habitat in the EIS. The DHSP's long-term and permanent impacts to native vegetation and habitat will be mitigated mainly through off-site acquisition and preservation of habitat. Therefore, the goal of this reclamation/ revegetation effort will be to prevent further degradation of disturbed sites, but not to restore pre-disturbance habitat values. The disturbance sites will be revegetated to stabilize soils; maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions, according to Mitigation Measure VEG-5. This section of the Closure and Reclamation Plan conforms to those requirements.

4.0 Decommissioning and Reclamation

The life of the Project is expected to be at least 30 years. When the Project has reached the limit of utility, it will be decommissioned and project sites will be reclaimed. Reclamation will be according to methods described in Section 5.0 and modified by lessons learned during the 30-year period between initial commercial operations and decommissioning (adaptive management). Decommissioning of the Project will be coordinated with the BLM. Decommissioned and reclaimed material will be sold to offset the costs of reclamation.

The overall decommissioning strategy will include the following major elements:

- Recycling of as much material as is feasible at that time. Removing all structures and facilities as specified below.
- Foundations will be removed to a depth of 3 feet below grade. Removed foundation material will be demolished and hauled to a permitted facility for disposal or become property of the demolition contractor. Demolition contractors will be required to remove materials of which they may choose to take ownership otherwise the materials will be disposed of at permitted facilities.
- Foundations deeper than 3 feet below grade will be abandoned in place.
- Solar array rack posts will be removed and salvaged.
- Voids created by foundation or post removal will be filled with surrounding soil.
- Crushed rock surfacing will be spread during recontouring of the surface to reestablish drainage patterns.
- Any fuel, lubricant or hazardous material spill will be remediated to current regulatory standards.
- For the modules, a take back or recycling program will be in place which will collect and recycle the solar modules at the end of their useful life. In general, the project owner will dismantle the arrays carefully to avoid breakage of the panels and ship the panels to the manufacturer's nearest storage facility to be re-used or recycled.
- The site will be re-contoured using standard grading equipment to maximize the likelihood of vegetation recovery over time; and minimize soil erosion, dust generation, and weed invasions.

The project owner will document implementation of the plan and compliance with environmental requirements. Monitoring of the site will continue for five years following the completion of decommissioning in order to assess achievement of the success criteria.

5.0 Reclamation Methods

Prior to initiating decommissioning activities, the project owner will contract with a qualified Reclamation Specialist to evaluate and prescribe specific reclamation measures throughout the project area. The Reclamation Specialist will coordinate with the project Designated Biologist and with the project owner to ensure that the prescriptions are implemented as written.

5.1 Site Preparation

enXco does not anticipate substantial grading or soil removal. Therefore, this Plan does not include measures for topsoil salvage, storage, or replacement. Any trenches, bores, or other excavations created during decommissioning activities will be filled to natural grade using local soils.

Reclamation work will be determined on a site-by-site basis, based on the advantages and disadvantages of soil treatment or site preparation methods to restore natural contours, protect the site from erosion damage by wind or water, and maximize likelihood of vegetation recovery. The specific site preparation measures will be determined prior to the start of the reclamation work in coordination with the BLM reclamation staff.

Soil decompaction can increase soil vulnerability to weeds or erosion, increase dust, or cause further damage to surviving rootstocks that may be present. The Reclamation Specialist will evaluate soil compaction and prescribe either no treatment, limited treatment using hand tools, light harrowing or disking with a tractor, or deeper disking or ripping, depending on specific circumstances. Where soil decompaction is implemented, follow-up measures to control dust and erosion will also be prescribed. Surface treatment such as soil imprinting may be prescribed, based on the extent of areas to be reseeded, soil condition, and availability of imprinting or similar equipment.

Where decommissioning or prior project-related disturbance causes alterations to natural channel morphology or runoff patterns, the Reclamation Specialist will prescribe recontouring or other measures such as hay bales, straw wattles, or other erosion control materials. Consistent with the IWMP, any such materials to be used at any project work site shall be certified weed free.

Where feasible, mulch used for erosion control will be produced from native vegetation cleared from the site. The Reclamation Specialist may recommend stockpiling the vegetation removed during decommissioning, for replacement onto the site either as crushed mulch, or as “vertical mulch” to reduce sun and wind exposure to the soil surface and germinating plants.

5.2 Plant Materials

enXco may re-seed reclamation areas with a native seed mix. The determination whether to re-seed and, if so, seeding rates (i.e., pounds per acre) will be made by the Reclamation Specialist, based on the nature of disturbance and condition of soils and evidence (if any) of re-sprouting from remaining rootstocks. The seed mix will consist primarily or exclusively of native early-successional species, listed below. There will be no re-seeding on sites where decommissioning and prior project activities left sufficient native vegetation in place, or where vegetation has recovered to meet the success criteria listed below (Section 5.5).

enXco will arrange for adequate seed supplies well in advance of scheduled seeding for each disturbed site. Due to the unpredictable rainfall and drought conditions throughout the Sonoran Desert region, seed cannot be reliably collected or acquired in any given year. Immediately following notification to BLM of planned closure, the Reclamation Specialist or Designated Biologist will estimate the total number of acres to be reseeded, and determine quantities of seed needed. enXco will collect seed, or will contract with suppliers or collectors, to acquire and store enough seed for all projected reseeding work. The Reclamation Specialist will be responsible for maintain a seed inventory based on the sample format shown in Table 1.

Table 1: Sample seed inventory management format.

Species (Latin and common names)	On hand (lb.)	On order (lb.)	Quantity needed for upcoming years (lb.)				
			Year 1	Year 2	Year 3	Year 4	Year 5

The seed mix will consist of the following species, all of which are characteristic early-successional species in the Sonoran desert.

- Desert needlegrass (Stipa [Achnatherum] speciosa)
- Brittlebush (Encelia farinosa)
- Cheesebush (Hymenoclea [Ambrosia] salsola)
- Burrobush (Ambrosia dumosa)

Total seeding rate will be no less than 20 pounds per acre. Specific proportions will be based upon seed availability and recommendations of the Reclamation Specialist. Depending on seed availability, other native species occurring on the site or nearby at similar exposure and elevation may be selected to replace those above. Any plant material used in revegetation must be locally native, and must occur on or near the project site. All seed to be used in revegetation will originate from the Sonoran Desert region of California, between approximately sea level and 2,500 feet elevation. enXco will require the supplier to provide location and elevation for each seed lot, and will not purchase or use seed originating outside these geographic and elevational bounds. Any seed from vendors or contracted collectors will be certified weed free. The project owner may collect seed on-site from remnant native vegetation. The collection of adequate seed supplies will likely necessitate repeated visits to any given collection area, depending on seasonality and annual productivity of the target plants. The project owner will be responsible for acquiring adequate seed to implement this plan. Seed collections by the project owner or its contractors or vendors will be made according to the following guidelines.

- Seed collection from plants to be removed or mown for project construction will be unrestricted.
- No seed will be collected from designated Wilderness Areas, DWMAs, WHMAs, or critical habitat, except within any approved project disturbance areas (i.e., gen-tie work sites or the 47-acre WHMA area within the solar facility site).
- Any seed collection on public lands other than the proposed Project site will be done under authorization from the BLM.
- No more than 40 percent of seeding plants in any collection area (excluding project disturbance areas) will be harvested. No more than 10 percent of mature seed on any single plant will be harvested.
- Access to collection areas will be via open, designated routes, or on foot; there will be no cross-county vehicle travel.
- Collectors will record and track seed lots, including collection date, collection location, elevation, dominant species at location, stand conditions, test data, bulk weight, and net weight (as pure live seed).

5.3 Seeding Methods and Schedule

Seeding methods and schedule will be prescribed by the Reclamation Specialist on a site by site basis, in coordination with BLM. Seeding methods may employ equipment (such as seed drill or hydroseeding equipment) for large areas. Some reclamation sites may be small or inaccessible to equipment. In these areas, seed will be broadcast using manually operated cyclone-type bucket spreaders, mechanical seed spreaders, blowers, or rubber-tired all-terrain vehicles equipped with mechanical broadcast spreaders. Seed in the spreader hoppers will be mixed to discourage separation of the component seed types. Where broadcast seeding is employed, seeded areas may be raked or harrowed to cover the seed, at the direction of the project Reclamation Specialist.

Re-seeding will be scheduled to minimize potential seed loss to granivorous birds and small mammals and maximize exposure to seasonal rainfall. Seeding will be done in late summer or early fall, to ensure that seed is in place prior to the onset of seasonal rain in late fall or early winter. Later seeding is likely to result in failed germination due to inadequate moisture availability.

Due to the arid climate and variable rainfall, germination and establishment success of seeded plants is not predictable. Low germination success in the first year following re-seeding may be consistent with the goal of this plan (i.e., to prevent or minimize further site degradation) during dry years, when erosion and weed cover are not problematic. However, enXco may need to take additional measures to minimize dust generation from sites where adequate plant cover does not re-establish (see monitoring and remediation measures below).

5.4 Reclamation and Revegetation Site Maintenance

Reclamation and revegetation sites will not be irrigated. The sites will be monitored for weed presence and abundance, and weed control will be implemented as needed, according to the project IWMP. Additional maintenance activities will consist of erosion control, soil stabilization, or other measures as needed, to be based on the results of monitoring.

5.5 Success Criteria

If the following success criteria have not been met within three years following recontouring and other reclamation activities, the project owner will be responsible for implementing remediation measures as needed. Following remediation work, the site will be subject to the success criteria and monitoring period as required for the initial reclamation, revegetation, or restoration.

1. At least 60 percent of the species observed within the reclamation areas will be native species that naturally occur in local desert scrub habitats.
2. Cover and density of non-native plant species within the reclamation areas will be no more than twice (2x) their cover and density in comparable adjacent lands that have not been disturbed by the project.
3. Soil stability and potential for erosion or dust source will be comparable to adjacent lands that have not been disturbed by the project.

5.6 Monitoring, Remediation, and Reporting

Following implementation of reclamation and/or revegetation measures, each temporarily disturbed site will be monitored annually to evaluate success, in terms of the success criteria above. Monitoring will continue for a period of no less than three years or until the defined success criteria are achieved. Remediation activities (such as additional planting, removal of non-native invasive species, or erosion control) will be taken during the 3-year period if necessary to ensure the success of the reclamation effort. If the site fails to meet the performance criteria after the 3-year maintenance and monitoring period, monitoring and remedial activities will continue on a yearly basis until the criteria are met.

If a fire or flood damages a reclamation site within the monitoring period, the project owner will be responsible for a one-time replacement. If a second fire or flood occurs, no replanting will be required unless the damage is caused by the project owner's activity (as determined by BLM or other firefighting agency investigation).

Throughout the decommissioning phase and for a minimum of 3 years following completion of decommissioning, the Designated Biologist and Reclamation Specialist will be responsible for providing annual Closure and Reclamation Progress Reports to the BLM, CDFG, USFWS, and JTNP for review and approval. Each annual report will include the following contents:

- Brief summary of decommissioning status, with a list of all sites treated or monitored during the preceding year
- Summary of reclamation progress and results since previous report, including a map of all reclamation activity since previous report.
- Seed inventory: accounting of materials acquired or used since previous report and materials needed for coming 5 year period.
- Monitoring results: Summarize monitoring results and completion status for all sites.
- Recommendations as applicable for remedial work such as reseeding, erosion control, weed control, or other maintenance activity.
- Representative site photographs.
- Notation of any other pertinent concerns (e.g., vehicle trespass, etc.).
- A comparison of annual success criteria with field conditions, identify any shortcomings, and recommend remedial measures necessary for the success of the Plan.

5.7 Adaptive Management

Adaptive management will be implemented in the event of unforeseen or probable but unpredictable circumstances. Adaptive management is defined for the purposes of this plan as a flexible, iterative approach to the long-term management of the site. It will be directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that are producing adverse results within the site. Adaptive management will include use of monitoring data gathered in the field during the plan to assess the health and vigor of the reclamation sites. Following an event that causes damage to all or part of the site, these data will be used in part to drive management considerations for repair of the damaged areas. Individual environmental stressors such as flooding or prolonged drought could require additional measures be conducted to ensure success.

6.0 Financing of Decommissioning and Reclamation

enXco affirms its obligation to decommission and restore this site as described in Section 4.0 of this document. enXco will purchase a performance bond or similar security to be issued by an insurance company or financial institution to guarantee the satisfactory decommissioning and reclamation of the project site. The bond will be obtained prior to the start of construction and will be structured such that the security will be returned to the project owner upon completion of the decommissioning and reclamation activities (with an amount held in reserve until the reclamation monitoring is complete).

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Appendix C.19

USFWS Section 7 Consultation Initiation Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-ERIV-10B0593-12TA403

JUN 13 2012

Memorandum:

To: District Manager, California Desert District, Bureau of Land Management,
Moreno Valley, California
Attention: Kim Marsden, Wildlife Biologist

From: Assistant Field Supervisor, Palm Springs Fish and Wildlife Office
Palm Springs, California

Subject: Request for Initiation of Formal Section 7 Consultation on the Proposed Desert Harvest Solar Power Project, Riverside County, California

This memorandum acknowledges that we received on May 10, 2012, the initiation request for formal consultation, dated May 8, 2012, pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.). The Bureau of Land Management (BLM) proposes to issue a right-of-way grant to enXco, a subsidiary of EDF Energies Nouvelles, for the Desert Harvest Solar Project, to construct, operate, maintain, and decommission a 150-megawatt photovoltaic solar energy facility and related infrastructure in unincorporated Riverside County, California. The BLM determined that the proposed project is likely to adversely affect the threatened Mojave desert tortoise (*Gopherus agassizii*).

The biological assessment (BA) has sufficient biological information for us to initiate consultation but does not include enough information for us to complete consultation with a comprehensive analysis of impacts for the entire project. To complete our analysis we will need clarification on several components of the project description. Communications from your staff indicate the applicant is considering the construction of an operations and maintenance (O & M) facility within the vicinity of the proposed solar energy facility. The BA discusses two options for the proposed O & M facility: either onsite at the northwest corner of the proposed project site or using an unidentified existing commercial building within 10 miles of the proposed project site. To define the action area and assess project impacts, we will need to know the exact location of the O & M facility. If the applicant intends to construct an off-site O & M facility, then please ensure that both the BA and draft Environmental Impact Statement (EIS) are updated and the documents include any relevant information needed for analysis, including pre-project surveys for listed species.

It is our understanding that we are consulting on the project description in the BA and not the preferred alternative in the draft EIS. However, it is unclear how the Federal Energy Regulatory

Commission land withdrawal affects potential development on the disjunct southwestern parcel, and if developed, the means of electrical interconnection. Please clarify how the land withdrawal affects the availability of this parcel for development and the electrical method (above-ground or underground) of transmission, if developed. Lastly, the BA is ambiguous on many aspects of the project description, such as water source (trucking or on-site wells), concrete (trucking or on-site batch plant), and gravel supply (trucking or on-site source). Due to the adjacency of the proposed project to designated critical habitat along Kaiser Road, the number off-site vehicle trips is a necessary component for the analysis of vehicle traffic and associated mortality of desert tortoise.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion. Assuming that all necessary project information is provided to the Service in a timely manner, we expect to provide you with our biological opinion no later than September 22, 2012. If we do not receive the additional information by August 8, 2012, this letter also functions as a request for your concurrence with a 60-day time extension, which would begin upon our receipt of the requested information, so that we will have adequate time to conduct a comprehensive impact analysis for the entire project. During the consultation process, we will continue to work cooperatively with your agency and the applicant to identify conservation measures to avoid and minimize impacts to desert tortoise and its habitat.

As a reminder, the Act requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options (50 CFR § 402.09). This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions about this consultation or the consultation process in general, please contact Tera Baird of my staff at (760) 322-2070, extension 217.

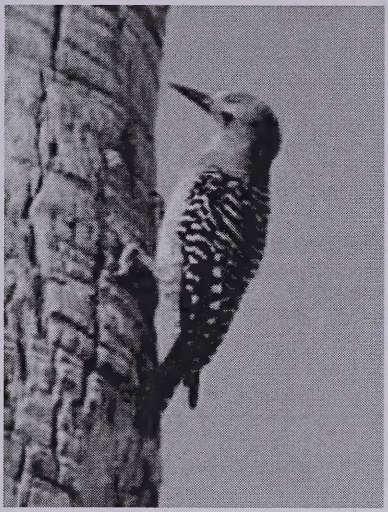
Appendix C.20

Gila Woodpecker Focused Survey Report

Desert Harvest Solar Project

Focused Surveys for the Gila Woodpecker in 2012

Riverside County, California



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Report Date: 19 July 2012

AMEC Project No. 11-554-00460

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APPENDIX A DESERT HARVEST SOLAR PROJECT BIRD SPECIES LIST

ACRONYMS AND ABBREVIATIONS

AMEC	AMEC Earth & Environmental, Inc.
BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
DHSP	Desert Harvest Solar Project

1.0 INTRODUCTION

AMEC Earth & Environmental, Inc. (AMEC) was contracted by Aspen Environmental Group (Aspen) to conduct focused surveys for the Gila Woodpecker (*Melanerpes uropygialis*) during the nesting season of 2012 for the proposed Desert Harvest Solar Project (DHSP), located in unincorporated Riverside County California. The proposed project consists of the development of a 100-150 mega-watt photovoltaic panel solar power plant.

On 27 December 2010, a Gila Woodpecker was observed by Chet McGaugh and Stephen J. Myers during setup of avian point count stations for DHSP. This bird was seen in desert ironwood trees near the project site's southeastern corner (see Aspen and AMEC 2012, Figures 1 - 3). No other observations of this species were made during the AMEC point count study, or during surveys for the Desert Tortoise (*Gopherus agassizii*) during spring 2010 and 2011 (AMEC 2011a, 2011b, 2011c). A sighting of Gila Woodpecker was reported on 28 September 2010, approximately 2 miles west of the Desert Harvest site during field surveys for from the Desert Sunlight Project (eBird data). Due to these sightings, the focused survey for the Gila Woodpecker was conducted to determine the presence or absence of the woodpecker during the nesting season.

Gila Woodpecker Natural History Summary

The Gila Woodpecker occurs in the southwestern United States and northwestern Mexico. Most Gila Woodpeckers in the U.S. occur in southern Arizona, with peripheral populations in extreme southeast California, extreme southern Nevada, and extreme southwestern New Mexico. In California they are primarily known from the Lower Colorado River Valley and the Imperial Valley (Edwards and Schnell 2000). They have also been found intermittently (presumably nesting) at Corn Springs, which is approximately 11 miles south-southeast of the DHSP site. They were observed at Corn Springs during May 2012 (eBird data).

Gila Woodpeckers are most often associated with saguaro cactus (*Carnegiea gigantea*), but also can occur in habitats with trees such as Fremont cottonwood (*Populus fremontii*), willow (*Salix* spp.), fan palm (*Washingtonia* spp.), mesquite (*Prosopis* spp.), blue palo verdes (*Parkinsonia florida*), and desert ironwood (*Olneya tesota*) (Grinnell and Miller 1944, Edwards and Schnell 2000).

Gila Woodpeckers forage on a wide variety of insects, as well as fruits and berries of species such as saguaro, mistletoe (*Phoradendron* spp.), and box-thorn (*Lycium* spp.). As with other species of woodpeckers, nesting is in cavities, and both sexes work on the excavations. Clutches of 4 to 5 eggs are laid, and the species has between one and three clutches per year.

Early Californian ornithologists believed that the Gila Woodpecker was expanding its range northward from the Colorado River Valley in the 1930s and 1940s, but more recently it has declined in the state (Grinnell and Miller 1944, Garrett and Dunn 1981, Edwards and Schnell 2000). The California Fish and Game Commission listed it as Endangered in March 1988.

2.0 PROJECT LOCATION AND DESCRIPTION

The DHSP site is located on public lands administered by the BLM in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' *Victory Pass* & *East of Victory Pass* quadrangles) (see Aspen and AMEC 2012, Figures 1 - 3). The applicant, enXco Development Corporation (enXco) proposes to build a 100 -150 mega-watt photovoltaic solar power generating plant. The Right of Way Application consists of two non-contiguous parcels. The northeastern parcel is 1,051 acres and the southwestern parcel is 157 acres. There are 180 acres of Blue Palo Verde –Ironwood Woodland (Sawyer et. al. 2009) on the DHSP project site. This habitat provides large blue palo verde trees and perhaps desert ironwoods suitable for Gila woodpecker nest excavation (Aspen and AMEC 2012).

Site topography is mostly flat with elevations ranging from 583 to 675 feet above sea level. Soils vary from sandy alluvium to hard packed desert pavement. Onsite ephemeral drainages flow southeasterly towards Desert Center at a slope of less that 1%.

Surrounding land uses include undeveloped natural open space to the west, north and south. Some of the lands to the southeast of the site were converted to agricultural uses (jojoba [*Simmondsia chinensis*] farming) in the past but now appear to be abandoned.

3.0 METHODS

No “official” survey protocol exists for the Gila Woodpecker. AMEC ornithologists decided that a full coverage walking survey, utilizing vocalization playback, was the best strategy. AMEC also determined that five survey visits to the project site, spaced at least two weeks apart, were adequate to locate Gila woopeckers if they were breeding on the site during the 2012 nesting season. During each survey, the ornithologist walked all suitable habitat on the site (i.e., areas supporting potential nesting trees; primarily desert ironwood, with lesser numbers of blue palo verde). Recorded Gila Woodpecker calls were played at spatial intervals of approximately 100 meters, and care was taken to broadcast calls within 100 meters of all suitable habitat on the site. During each period of playback, the biologist played approximately 2 minutes of calls, followed by 2-3 minutes of listening for responses. The five surveys were conducted from late March through May, which is the peak period of breeding in southern California (Edwards and Schnell 2000).

Prior to the field surveys, Myers consulted with Dr. Lawrence F. LaPré of the BLM to assure that this methodology was acceptable. Dr. LaPré agreed that the methodology would allow for a thorough survey for Gila woodpecker at the project site.

Table 1 includes the surveyors, survey dates, times, and weather variables.

Table 1.
Desert Harvest Solar Project Focused Gila Woodpecker 2012 Survey Data

Date	Surveyor	Time	Temperature (°F)	Cloud Cover (%)	Wind Speed (mph)
27 March	CM	0815-1300	63-83	0	0-3
9 April	SJM	0530-1100	66-94	0	0-3
23 April	JFG	0620-1235	71-98	0	0-7
10 May	CM	0720-1230	82-97	0	0-4
24 May	SJM	0510-1025	73-93	0	0-10

Key to Surveyors: JFG = John F. Green, CM = Chet McGaugh, SJM = Stephen J. Myers

A complete list of bird species detected during this study is included as Appendix 2.

4.0 RESULTS AND DISCUSSION

No Gila Woodpeckers were detected during the focused surveys. Based on the collective experience of the observers and published literature (Edwards and Schnell 2000, Garrett and Dunn 1981, Grinnell and Miller 1944), the site provides suitable habitat, though probably marginally so. Most blue palo verde trees on the site are relatively small, but there are occasional trees large enough for woodpeckers to excavate cavities. Decadent desert ironwoods, with large rotting trunks and branches may also be suitable for nesting cavity excavation. Ash-throated Flycatchers (*Myiarchus cinerascens*) were observed using such cavities as nest sites in 2012 at a nearby project site.

A total of 39 bird species was detected during the surveys (see Appendix 2).

5.0 LITERATURE CITED

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APPENDIX A

DESERT HARVEST SOLAR PROJECT BIRD SPECIES LIST

APPENDIX A
BIRD SPECIES LIST

BIRDS	**AVES**
New World Quail	**Odontophoridae**
Gambel's Quail	*Callipepla gambelii*
Cormorants	**Phalacrocoracidae**
Double-crested Cormorant	*Phalacrocorax auritus*
New World Vultures	**Cathartidae**
Turkey Vulture	*Cathartes aura*
Ospreys	**Pandionidae**
Osprey	*Pandion haliaetus*
Hawks, Harriers, & Eagles	**Accipitridae**
Cooper's Hawk	*Accipiter cooperii*
Swainson's Hawk	*Buteo swainsoni*
Red-tailed Hawk	*Buteo jamaicensis*
Pigeons & Doves	**Columbidae**
Eurasian Collared-Dove (nonnative)	*Streptopelia decaocto*
White-winged Dove	*Zenaida asiatica*
Mourning Dove	*Zenaida macroura*
Cuckoos & Allies	**Cuculidae**
Greater Roadrunner	*Geococcyx californianus*
Goatsuckers	**Caprimulgidae**
Lesser Nighthawk	*Chordeiles acutipennis*
Common Poorwill	*Phalaenoptilus nuttallii*
Hummingbirds	**Trochilidae**
Anna's Hummingbird	*Calypte anna*
Costa's Hummingbird	*Calypte costae*
Woodpeckers	**Picidae**
Northern Flicker	*Colaptes auratus*
Tyrant Flycatchers	**Tyrannidae**
Hammond's Flycatcher	*Empidonax hammondii*
Say's Phoebe	*Sayornis saya*
Ash-throated Flycatcher	*Myiarchus cinerascens*

Shrikes	**Laniidae**
Loggerhead Shrike	*Lanius ludovicianus*
Jays, Magpies, & Crows	**Corvidae**
Western Scrub-Jay	*Aphelocoma californica*
Common Raven	*Corvus corax*
Swallows	**Hirundinidae**
Tree Swallow	*Tachycineta bicolor*
Barn Swallow	*Hirunda rustica*
Penduline Tits & Verdins	**Remizidae**
Verdin	*Auriparus flaviceps*
Old World Warblers & Gnatcatchers	**Sylviidae**
Black-tailed Gnatcatcher	*Polioptila melanura*
Mockingbirds, Thrashers, & Allies	**Mimidae**
Northern Mockingbird	*Mimus polyglottos*
Silky-Flycatchers	**Ptilogonatidae**
Phainopepla	*Phainopepla nitens*
Parulidae	**Wood-Warblers**
Orange-crowned Warbler	*Oreothlypis celata*
Lucy's Warbler	*Oreothlypis luciae*
Yellow-rumped Warbler	*Setophaga coronate*
Wilson's Warbler	*Cardellina pusilla*
Emberizids	**Emberizidae**
Brewer's Sparrow	*Spizella breweri*
Black-throated Sparrow	*Amphispiza bilineata*
White-crowned Sparrow	*Zonotrichia leucophrys*
Cardinals and Allies	**Cardinalidae**
Western Tanager	*Piranga ludoviciana*
Lazuli Bunting	*Passerina amoena*
Blackbirds & Allies	**Icteridae**
Bullock's Oriole	*Icterus bullockii*
Finches	**Fringillidae**
House Finch	*Carpodacus mexicanus*

Appendix D

Air Quality/Greenhouse Gas Calculations

Desert Harvest

Riverside-Mojave Desert SCAQMD County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Utility Company**	Southern California Edison
Climate Zone	10	**Precipitation Freq (Days)**	28		

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - 250*(3/1211)

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	5.95	31.42	28.20	0.05	27.02	1.77	28.79	2.85	1.77	4.62	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	16.99	112.40	90.58	0.16	79.45	6.10	85.56	7.68	6.10	13.78	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	10.32	68.82	57.33	0.11	52.67	3.66	56.32	5.09	3.66	8.75	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	**33.26**	**212.64**	**176.11**	**0.32**	**159.14**	**11.53**	**170.67**	**15.62**	**11.53**	**27.15**	**0.00**	**27,850.06**	**27,850.06**	**2.62**	**0.00**	**27,905.02**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	4.62	15.27	27.66	0.05	9.63	1.11	10.74	0.97	1.11	2.08	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	11.84	45.80	95.93	0.16	28.23	3.61	31.84	2.57	3.61	6.18	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	7.52	29.21	61.39	0.11	18.71	2.36	21.07	1.70	2.36	4.06	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	**23.98**	**90.28**	**184.98**	**0.32**	**56.57**	**7.08**	**63.65**	**5.24**	**7.08**	**12.32**	**0.00**	**27,850.06**	**27,850.06**	**2.62**	**0.00**	**27,905.02**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.53**	**0.46**	**4.55**	**0.01**	**8.94**	**0.03**	**8.97**	**0.85**	**0.03**	**0.88**	**326.54**	**955.74**	**1,282.28**	**19.36**	**0.01**	**1,690.86**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.53**	**0.46**	**4.55**	**0.01**	**8.94**	**0.03**	**8.97**	**0.85**	**0.03**	**0.88**	**326.54**	**549.34**	**875.88**	**19.34**	**0.00**	**1,281.91**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Oxidation Catalyst for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.84	0.00	0.84	0.32	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	4.54	25.46	16.36	0.03		1.55	1.55		1.55	1.55	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	**4.54**	**25.46**	**16.36**	**0.03**	**0.84**	**1.55**	**2.39**	**0.32**	**1.55**	**1.87**	**0.00**	**2,586.58**	**2,586.58**	**0.37**	**0.00**	**2,594.35**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	15.10	0.00	15.10	1.47	0.00	1.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	10.37	0.17	10.54	1.03	0.17	1.20	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	**1.41**	**5.96**	**11.83**	**0.02**	**26.18**	**0.22**	**26.40**	**2.53**	**0.22**	**2.75**	**0.00**	**1,590.58**	**1,590.58**	**0.09**	**0.00**	**1,592.50**

3.2 Material - 2012

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.33	0.00	0.33	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	3.21	9.32	15.82	0.03		0.89	0.89		0.89	0.89	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	**3.21**	**9.32**	**15.82**	**0.03**	**0.33**	**0.89**	**1.22**	**0.12**	**0.89**	**1.01**	**0.00**	**2,586.58**	**2,586.58**	**0.37**	**0.00**	**2,594.35**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	5.08	0.00	5.09	0.47	0.00	0.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	3.51	0.17	3.68	0.35	0.17	0.52	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	**1.41**	**5.96**	**11.83**	**0.02**	**9.30**	**0.22**	**9.53**	**0.85**	**0.22**	**1.07**	**0.00**	**1,590.58**	**1,590.58**	**0.09**	**0.00**	**1,592.50**

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	13.32	96.53	58.59	0.11		5.50	5.50		5.50	5.50	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	**13.32**	**96.53**	**58.59**	**0.11**		**5.50**	**5.50**		**5.50**	**5.50**	**0.00**	**9,513.40**	**9,513.40**	**1.08**	**0.00**	**9,536.14**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	45.81	0.00	45.81	4.46	0.00	4.46	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	31.49	0.45	31.94	3.13	0.45	3.58	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	**3.67**	**15.87**	**32.00**	**0.06**	**79.46**	**0.60**	**80.05**	**7.68**	**0.60**	**8.28**	**0.00**	**4,741.41**	**4,741.41**	**0.26**	**0.00**	**4,746.74**

3.3 Building Construction - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.17	29.93	63.93	0.11		3.01	3.01		3.01	3.01	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	**8.17**	**29.93**	**63.93**	**0.11**		**3.01**	**3.01**		**3.01**	**3.01**	**0.00**	**9,513.40**	**9,513.40**	**1.08**	**0.00**	**9,536.14**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	15.42	0.00	15.43	1.43	0.00	1.43	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	10.65	0.45	11.10	1.05	0.45	1.50	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	**3.67**	**15.87**	**32.00**	**0.06**	**28.23**	**0.60**	**28.83**	**2.57**	**0.60**	**3.17**	**0.00**	**4,741.41**	**4,741.41**	**0.26**	**0.00**	**4,746.74**

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.22	59.46	38.32	0.07		3.30	3.30		3.30	3.30	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	**8.22**	**59.46**	**38.32**	**0.07**		**3.30**	**3.30**		**3.30**	**3.30**	**0.00**	**6,305.81**	**6,305.81**	**0.66**	**0.00**	**6,319.77**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	30.37	0.00	30.37	2.96	0.00	2.96	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	20.87	0.26	21.13	2.08	0.26	2.34	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	**2.10**	**9.36**	**19.01**	**0.04**	**52.67**	**0.36**	**53.03**	**5.10**	**0.36**	**5.46**	**0.00**	**3,112.29**	**3,112.29**	**0.16**	**0.00**	**3,115.54**

3.3 Building Construction - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.42	19.84	42.38	0.07		2.00	2.00		2.00	2.00	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	**5.42**	**19.84**	**42.38**	**0.07**		**2.00**	**2.00**		**2.00**	**2.00**	**0.00**	**6,305.81**	**6,305.81**	**0.66**	**0.00**	**6,319.77**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	10.22	0.00	10.22	0.95	0.00	0.95	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	7.06	0.26	7.32	0.70	0.26	0.96	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	**2.10**	**9.36**	**19.01**	**0.04**	**18.71**	**0.36**	**19.07**	**1.71**	**0.36**	**2.07**	**0.00**	**3,112.29**	**3,112.29**	**0.16**	**0.00**	**3,115.54**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Unmitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1.39718e+006					406.40	0.02	0.01	408.95
Total						**406.40**	**0.02**	**0.01**	**408.95**

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					326.54	19.30	0.00	731.79
Unmitigated					326.54	19.30	0.00	731.79
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO_2	Total CO_2	CH_4	N_2O	CO_2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						**326.54**	**19.30**	**0.00**	**731.79**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO_2	Total CO_2	CH_4	N_2O	CO_2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						**326.54**	**19.30**	**0.00**	**731.79**

9.0 Vegetation

Desert Harvest

Riverside-Mojave Desert SCAQMD County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Utility Company**	Southern California Edison
Climate Zone	10	**Precipitation Freq (Days)**	28		

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - 250*(3/1211)

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	142.19	734.73	710.65	1.06	679.43	41.16	720.60	70.26	41.16	111.43	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	133.72	865.08	742.11	1.23	659.89	46.76	706.65	63.62	46.76	110.39	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	122.54	799.15	704.92	1.23	659.89	42.30	702.18	63.62	42.30	105.92	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	111.29	359.15	698.13	1.06	242.37	25.84	268.21	23.80	25.84	49.64	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	94.27	354.63	783.09	1.23	234.74	27.67	262.41	21.20	27.67	48.88	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	90.16	341.02	751.84	1.23	234.74	27.26	262.00	21.20	27.26	48.46	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**9.00**	**3.50**	**30.68**	**0.04**	**49.44**	**0.18**	**49.62**	**4.70**	**0.18**	**4.88**		**3,461.62**		**0.24**	**0.00**	**3,466.61**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**9.00**	**3.50**	**30.68**	**0.04**	**49.44**	**0.18**	**49.62**	**4.70**	**0.18**	**4.88**		**3,461.62**		**0.24**	**0.00**	**3,466.61**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Oxidation Catalyst for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.54	0.00	19.54	6.63	0.00	6.63						0.00
Off-Road	105.52	592.31	380.48	0.66		36.03	36.03		36.03	36.03		66,325.41		9.48		66,524.56
Total	**105.52**	**592.31**	**380.48**	**0.66**	**19.54**	**36.03**	**55.57**	**6.63**	**36.03**	**42.66**		**66,325.41**		**9.48**		**66,524.56**

3.2 Material - 2012

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	380.38	0.09	380.47	37.02	0.09	37.11		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	261.39	3.90	265.29	25.94	3.90	29.84		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	**36.66**	**142.42**	**330.18**	**0.40**	**659.90**	**5.13**	**665.03**	**63.64**	**5.13**	**68.77**		**41,230.23**		**2.52**		**41,283.08**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.62	0.00	7.62	2.58	0.00	2.58						0.00
Off-Road	74.62	216.73	367.96	0.66		20.71	20.71		20.71	20.71	0.00	66,325.41		9.48		66,524.56
Total	**74.62**	**216.73**	**367.96**	**0.66**	**7.62**	**20.71**	**28.33**	**2.58**	**20.71**	**23.29**	**0.00**	**66,325.41**		**9.48**		**66,524.56**

3.2 Material - 2012

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	128.18	0.09	128.27	11.86	0.09	11.95		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	88.44	3.90	92.35	8.68	3.90	12.58		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	**36.66**	**142.42**	**330.18**	**0.40**	**234.75**	**5.13**	**239.89**	**21.22**	**5.13**	**26.35**		**41,230.23**		**2.52**		**41,283.08**

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	102.08	739.89	449.05	0.82		42.17	42.17		42.17	42.17		80,379.94		9.15		80,572.07
Total	**102.08**	**739.89**	**449.05**	**0.82**		**42.17**	**42.17**		**42.17**	**42.17**		**80,379.94**		**9.15**		**80,572.07**

3.3 Building Construction - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	380.37	0.02	380.39	37.01	0.02	37.03		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	261.39	3.44	264.83	25.94	3.44	29.38		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	**31.63**	**125.19**	**293.06**	**0.40**	**659.89**	**4.60**	**664.49**	**63.63**	**4.60**	**68.23**		**40,498.93**		**2.31**		**40,547.40**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.94		9.15		80,572.07
Total	**62.64**	**229.45**	**490.03**	**0.82**		**23.08**	**23.08**		**23.08**	**23.08**	**0.00**	**80,379.94**		**9.15**		**80,572.07**

3.3 Building Construction - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	128.17	0.02	128.18	11.85	0.02	11.86		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	88.44	3.44	91.89	8.68	3.44	12.12		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	**31.63**	**125.19**	**293.06**	**0.40**	**234.74**	**4.60**	**239.34**	**21.21**	**4.60**	**25.80**		**40,498.93**		**2.31**		**40,547.40**

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	95.01	687.57	443.11	0.82		38.12	38.12		38.12	38.12		80,379.84		8.48		80,557.84
Total	**95.01**	**687.57**	**443.11**	**0.82**		**38.12**	**38.12**		**38.12**	**38.12**		**80,379.84**		**8.48**		**80,557.84**

3.3 Building Construction - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	380.37	0.01	380.39	37.01	0.01	37.02		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	261.39	3.03	264.41	25.94	3.03	28.97		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	**27.53**	**111.58**	**261.81**	**0.40**	**659.89**	**4.18**	**664.07**	**63.63**	**4.18**	**67.81**		**40,104.22**		**2.12**		**40,148.97**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.84		8.48		80,557.84
Total	**62.64**	**229.45**	**490.03**	**0.82**		**23.08**	**23.08**		**23.08**	**23.08**	**0.00**	**80,379.84**		**8.48**		**80,557.84**

3.3 Building Construction - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	128.17	0.01	128.18	11.85	0.01	11.86		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	88.44	3.03	91.47	8.68	3.03	11.71		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	**27.53**	**111.58**	**261.81**	**0.40**	**234.74**	**4.18**	**238.92**	**21.21**	**4.18**	**25.39**		**40,104.22**		**2.12**		**40,148.97**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Unmitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**6.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**6.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Appendix E.2

RWQCB Letter

From: Jay Mirpour <JMirpour@waterboards.ca.gov>
Sent: Tuesday, June 26, 2012 10:48 AM
To: Jared Varonin
Cc: lcox@s37consultants.com; John Carmona
Subject: RE: 401 Water Quality Certification Question - Desert Center, CA

Hello Mr. Varonin:

Based on the following information that you provided on 6/22/2012, it appears that neither a 401 Water Quality Certification nor waste discharge requirements is necessary:

a) USACE's letter dated May 29, 2012 stating that no "Waters of the U.S." occur within the project boundaries.
b) CDFG will take jurisdiction over all on-site drainages/washes.

Thank you

Jay Mirpour

>>> Jared Varonin <Jvaronin@aspeneg.com> 6/22/2012 2:00 PM >>>
Mr. Mirpour,

In our last correspondence this past December (2011) you had indicated that prior to determining whether or not the Desert Harvest project was exempt from obtaining a 401 and /or WDR you needed to first find out whether or not CDFG and/or the USACE would be asserting jurisdiction over the on-site desert washes. We have completed that process with the USACE and attached to this email is a letter from the USACE stating that no "Waters of the U.S." occur within the project boundaries. While we have not yet completed the permitting process with CDFG they have indicated that they will be taken jurisdiction over all on-site drainages/washes. Is this information sufficient for you to determining whether or not the Desert Harvest project is exempt from the 401 and /or WDR process? Please let me know if you have any questions or need additional information.

Thanks,

Jared

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group
5020 Chesebro Road, Suite 200
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Fax: 818.597.8001
jvaronin@aspeneg.com
www.aspeneg.com

-----Original Message-----
From: Jay Mirpour [mailto:JMirpour@waterboards.ca.gov]
Sent: Friday, December 02, 2011 1:54 PM
To: jared varonin
Cc: John Carmona
Subject: RE: 401 Water Quality Certification Question - Desert Center, CA

Thank you Mr. Varonin:

It is very difficult to exempt a project not reviewing the application and supplemental information.

Once you receive answers from both agencies, please contact us and we'll see whether you will need to submit an application or provided information will be sufficient to determine that 401 or WDR required.

Thanks

Jay

Jay J. Mirpour
Water Resources Control Engineer
California Regional Water Quality Control Board Colorado River Basin Region - 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
Ph: (760) 776-8981
Fax: (760) 341-6820
E-mail: jmirpour@waterboards.ca.gov

>>> jared varonin <JVaronin@aspeneg.com> 12/2/2011 1:36 PM >>>
Thank you for such a quick response. We are currently seeking written confirmation from the Corps as to on-site drainages. Given the fact the same drainages occurring on the adjacent project flow through our site, and the Corps determined that those drainages were not federal jurisdictional waters, we are expecting the same result for our request. We have mapped all the drainages on-site and they do qualify as Waters of the State so we will be seeking permit from CDFG. CDFG will be involved in the development of the mitigation plan for the project.

Once we have confirmation from the USACE that the waters are not federally jurisdictional, would we still need to complete a 401 application for your review or could we send you a written request for confirmation that a 401 will not be required, with the Corps letter attached?

Thanks,

Jared

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

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jvaronin@aspeneg.com
www.aspeneg.com

-----Original Message-----
From: Jay Mirpour [mailto:JMirpour@waterboards.ca.gov]
Sent: Friday, December 02, 2011 1:30 PM
To: jared varonin
Cc: John Carmona
Subject: Re: 401 Water Quality Certification Question - Desert Center, CA

Hello Mr. Varonin:

Have you contacted the US Army Corps of Engineers? If they require you to get a 404, then you will need to receive a 401 from our office.

Have you also contacted the CA dept. of Fish & Game? If only the Waters of State is impacted (means no 404 required) and you have addressed your mitigation plans and they have approved it, then there may be no need to receive a 401 or WDR from us.

The best way to approach your project is first to contact the US Army Corps of Engineers and then submit a 401 application to us to review.

Thanks

Jay

Jay J. Mirpour
Water Resources Control Engineer
California Regional Water Quality Control Board
Colorado River Basin Region - 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
Ph: (760) 776-8981
Fax: (760) 341-6820
E-mail: jmirpour@waterboards.ca.gov

>>> jared varonin <JVaronin@aspeneg.com> 12/2/2011 11:18 AM >>>
Dear Mr. Mirpour,

I left you a voice mail yesterday but thought it might be easier/quicker for you to respond via email. I am working on a solar project in the Desert Center area west of Blythe going by the name of "Desert Harvest." This project is located adjacent to another solar project currently under construction by the name of "Desert Sunlight." The Final Record of Decision for the Desert Sunlight project determined/stated that "In the absence of Waters of the U.S., a CWA Section 401 Certification from the Colorado Basin Water Quality Control Board (RWQCB) will not be required." The footprint for the new Desert Harvest project is considerably smaller than Desert Sunlight and lies within the same watershed that drains to Palen Dry Lake. We have completed a delineation of all potentially jurisdictional waters on-site and, like with the findings of the Desert Sunlight project, have determined that the ephemeral desert dry washes present within the project site would be considered non-jurisdictional under the Clean Water Act.

I wanted to confirm with you that, as with the Desert Sunlight project, the Desert Harvest project would not be required to obtain a 401 Water Quality Certification from the water board. I have attached a PDF of one of the figures from the FEIS for Desert Sunlight. The DEIS for Desert Harvest is not out yet so I can't release any project specific figures at this time. On the figure you will see the Desert Sunlight study area in the top left corner. I drew a red ellipse just below this area to indicate the location of the Desert Harvest project. The northern extent of the project runs along the fence line of the Desert Sunlight projects southwest corner but does not extend as far east as Desert Sunlight.

If you could just confirm for me that, as with Desert Sunlight, Desert Harvest would not be required to obtain a 401 Water Quality Certification I would greatly appreciate it. Please call me if you have any questions.

Thanks,

Jared Varonin

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group
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Appendix F

Noise Calculations

California Vehicle Noise Calculation: Construction Traffic (ALL)

Project Number: 3133.002
Project Name: Desert Harvest Solar Project
Model Description: Reference Energy Mean Emission Levels (REMEL) for California Vehicle Noise, Caltrans Technical Noise Supplement (11/09): Figure 5-9
Model Assumptions: no shielding, no barrier, no traffic flow adjustment (result : highest noise); uniform vehicle class mix
Scenarios: Leq(h) from hour vph; CNEL from ADT vpd-distributed per time fractions

Existing Conditions I-10 West of Highway 177

Distance: >15m Ref: 15.0 (m)
Drop-off (alpha 0.5=soft, 0=hard): 0.00 (alpha)
Speed: 65 (mph)
105 (kph)

Vehicle Distribution Fractions

HD Tks	MD Tks	Autos	
34.29	5.16	60.55	Fraction
85.2	81.9	75.5	REMEL (dBA)

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
91	4.7	4.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
I-10 west of Highway 177	23000	2300.0	1744.2	360.3	109.9	81.72	80.52	73.67	68.51	79.6	*466.0*	*1004.1*	*2163.2*

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-2.

Existing + DHSP: I-10 West of Highway 177

Distance: >15m Ref: 15.0 (m)
Drop-off (alpha 0.5=soft, 0=hard): 0.00 (alpha)
Speed: 65 (mph)
105 (kph)

Vehicle Distribution Fractions

HD Tks	MD Tks	Autos	
33.93	5.04	61.03	Fraction
85.2	81.9	75.5	REMEL (dBA)

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
90.4	4.6	5.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
I-10 west of Highway 177	23550	2355.0	1774.3	363.3	129.8	81.79	80.56	73.67	69.20	79.9	*482.9*	*1040.4*	*2241.5*

Existing Conditions I-10 East of Highway 177

Distance: >15m Ref: 15.0 (m)
Drop-off (alpha 0.5=soft, 0=hard): 0.00 (alpha)
Speed: 65 (mph)
105 (kph)

Vehicle Distribution Fractions

HD Tks	MD Tks	Autos	
37.79	5.61	56.60	Fraction
85.2	81.9	75.5	REMEL (dBA)

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
91	4.7	4.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
I-10 east of Highway 177	21400	2140.0	1622.8	335.3	102.2	81.73	80.52	73.68	68.52	79.7	*466.4*	*1004.8*	*2164.8*

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-3.

Source: Desert Sunlight Data, Table E2-1

I-10 West of SR-177	**Existing**	**DS Alt 1&2 2012**	**Delta**	
ADT	23000	23157	157	
MD-Truck % of ADT	5.16%	5.50%		
HD-Truck % of ADT	34.29%	35.40%		
MD-Trucks	1187	1274	87	
HD-Trucks	7887	8198	311	
Autos	13927	13686	-241	ODD

I-10 West of SR-177	**Existing**	**Project**	**E+P**
MD-Trucks	1187	0	1187
HD-Trucks	7887	104	7991
Autos	13926	446	14372
TOTAL	23000	550	23550
		MD-Truck % of ADT	5.04%
		HD-Truck % of ADT	33.93%
		Auto % of ADT	61.03%
		check	100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	20930	362	21292	90.4
7pm-10pm	1081	9	1090	4.6
10pm-7am	989	179	1168	5.0
check	23000	550	23550	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Source: Desert Sunlight Data, Table E2-1

I-10 East of SR-177	Existing Conditions	DS Alt 1&2 2012	Delta	
ADT	21400	21485	85	
MD-Truck % of ADT	5.61%	6.0%		
HD-Truck % of ADT	37.79%	40.3%		
MD-Trucks	1201	1289	89	
HD-Trucks	8087	8658	571	
Autos	12112	11537	-575	ODD

I-10 East of SR-177	**Existing**	**Project**	**E+P**
MD-Trucks	1201	0	1201
HD-Trucks	8087	104	8191

Existing + DHSP: I-10 East of Highway 177

Vehicle Distribution Fractions

			HD Tks	**MD Tks**	**Autos**	
Distance: >15m Ref:	15.0	(m)	37.32	5.47	57.21	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	85.2	81.9	75.5	REMEL (dBA)
Speed:	65	(mph)				
	105	(kph)				

Number of Hours: (hrs)

7am-7pm	**7pm-10pm**	**10pm-7am**
12	3	9

Backgd Traffic: (%)

7am-7pm	**7pm-10pm**	**10pm-7am**
90.4	4.6	5.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
I-10 east of Highway 177	21950	2195.0	1653.0	338.3	122.1	81.79	80.56	73.67	69.25	79.9	*484.1*	*1043.0*	*2247.1*

Autos	12112		446	12558
TOTAL	21400		550	21950
		MD-Truck % of ADT		5.47%
		HD-Truck % of ADT		37.32%
		Auto % of ADT		57.21%
		check		100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	19474	362	19836	90.4
7pm-10pm	1006	9	1015	4.6
10pm-7am	920	179	1099	5.0
check	21400	550	21950	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing Conditions Highway 177 South of Kaiser Road

Vehicle Distribution Fractions

			HD Tks	**MD Tks**	**Autos**	
Distance: >15m Ref:	15.0	(m)	27.5	10.9	61.6	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)
Speed:	50	(mph)				
	80	(kph)				

Number of Hours: (hrs)

7am-7pm	**7pm-10pm**	**10pm-7am**
12	3	9

Backgd Traffic: (%)

7am-7pm	**7pm-10pm**	**10pm-7am**
70.60	8.48	20.92

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Highway 177 south of Kaiser Road	2925	292.5	172.1	82.7	68.0	70.90	68.59	65.41	64.56	72.0	*143.2*	*308.5*	*664.6*

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Source: Desert Sunlight Data, Table E2-1

SR-177 s.o. Kaiser Rd.	Existing Conditions	DS Alt 1&2 2012	Delta
ADT	2250	2475	225
MD-Truck % of ADT	4.40%	5.7%	
HD-Truck % of ADT	9.60%	9.5%	
MD-Trucks	99	141	42
HD-Trucks	216	235	19
Autos	1935	2099	164

Existing + DHSP: Highway 177 South of Kaiser Road

Vehicle Distribution Fractions

			HD Tks	**MD Tks**	**Autos**	
Distance: >15m Ref:	15.0	(m)	26.13	9.15	64.72	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)
Speed:	50	(mph)				
	80	(kph)				

Number of Hours: (hrs)

7am-7pm	**7pm-10pm**	**10pm-7am**
12	3	9

Backgd Traffic: (%)

7am-7pm	**7pm-10pm**	**10pm-7am**
69.8	7.4	22.8

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Highway 177 south of Kaiser Road	3475	347.5	202.3	85.7	87.9	71.41	69.06	65.33	65.44	72.7	*159.8*	*344.2*	*741.6*

EXISTING TRAFFIC COUNTS 22-Nov-11 (SR-177 between I-10 WB ramp and Kaiser Rd.)

SR-177 s.o. Kaiser Rd.	**Existing**		**Project**	**E+P**
MD-Trucks	318		0	318
HD-Trucks	804		104	908
Autos	1803		446	2249
TOTAL	2925		550	3475
		MD-Truck % of ADT		9.2%
		HD-Truck % of ADT		26.1%
		Auto % of ADT		64.7%
		check		100.0%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	2065	362	2427	69.8
7pm-10pm	248	9	257	7.4
10pm-7am	612	179	791	22.8
check	2925	550	3475	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Highway 177 South of Kaiser Road

			Vehicle Distribution Fractions			
			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	25.05	9.73	65.22	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)
Speed:	50	(mph)				
	80	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
68.9	6.9	24.2

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
Highway 177 south of Kaiser Road	3700	370.0	212.4	85.7	99.3	71.58	69.17	65.22	65.87	73.0	167.8	361.6	779.1

CUMULATIVE

SR-177 s.o. Kaiser Rd.	E+P	Desert Sunlight	E+P+DS
MD-Trucks	318	42	360
HD-Trucks	908	19	927
Autos	2249	164	2413
TOTAL	3475	225	3700
		MD-Truck % of ADT	9.73%
		HD-Truck % of ADT	25.05%
		Auto % of ADT	65.22%
		check	100.00%

Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	2427	122	2549	68.9
7pm-10pm	257	0	257	6.9
10pm-7am	791	103	894	24.2
check	3475	225	3700	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Existing Conditions Kaiser Road South of Lake Tamarisk

			Vehicle Distribution Fractions			
			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	17.30	14.40	68.40	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)
Speed:	45	(mph)				
	72	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
79.68	4.14	16.19

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
Kaiser Road south of Lake Tamarisk	556	55.6	36.9	7.7	10.0	61.91	60.13	53.31	54.46	62.2	31.9	68.6	147.9

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Existing + DHSP: Kaiser Road South of Lake Tamarisk

			Vehicle Distribution Fractions			
			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	18.08	7.23	74.68	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)
Speed:	45	(mph)				
	72	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
72.8	2.9	24.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
Kaiser Road south of Lake Tamarisk	1106	110.6	67.1	10.7	29.9	64.64	62.47	54.48	58.95	66.0	57.0	122.7	264.4

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. s.o. Tamarisk Lake	Existing Conditions	Alt 1&2 2012	Delta
ADT	150	372	222
MD-Truck % of ADT	20.40%	24.8%	
HD-Truck % of ADT	6.50%	21.5%	
MD-Trucks	30	92	62
HD-Trucks	10	80	70
Autos	110	200	90

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. s.o. Tamarisk Lake	Existing	Project	E+P
MD-Trucks	80	0	80
HD-Trucks	96	104	200
Autos	380	446	826
TOTAL	556	550	1106
		MD-Truck % of ADT	7.23%
		HD-Truck % of ADT	18.08%
		Auto % of ADT	74.68%
		check	100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	443	362	805	72.8
7pm-10pm	23	9	32	2.9
10pm-7am	90	179	269	24.3
check	556	550	1106	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Kaiser Road South of Lake Tamarisk

Vehicle Distribution Fractions

			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	20.33	10.69	68.98	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)
Speed:	45	(mph)				
	72	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
71.6	2.4	26.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road south of Lake Tamarisk	1328	132.8	79.3	10.7	38.3	65.96	63.72	55.01	60.57	67.5	*71.8*	*154.8*	*333.4*

Existing Conditions Kaiser Road North of Lake Tamarisk

Vehicle Distribution Fractions

			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	2.50	19.30	78.20	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)
Speed:	45	(mph)				
	72	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
82.35	3.36	14.29

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	119	11.9	8.2	1.3	1.9	52.41	50.78	42.90	44.42	52.3	*7.0*	*15.2*	*32.7*

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Existing + DHSP: Kaiser Road North of Lake Tamarisk

Vehicle Distribution Fractions

			HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0	(m)	15.99	3.44	80.57	Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)
Speed:	45	(mph)				
	72	(kph)				

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
68.8	1.9	29.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	669	66.9	38.3	4.3	21.8	61.85	59.44	49.97	56.98	63.7	*40.4*	*86.9*	*187.3*

CUMULATIVE

Kaiser Rd. s.o. Tamarisk Lake	**E+P**	**Desert Sunlight**	**E+P+DS**
MD-Trucks	80	62	142
HD-Trucks	200	70	270
Autos	826	90	916
TOTAL	1106	222	1328
		MD-Truck % of ADT	10.7%
		HD-Truck % of ADT	20.3%
		Auto % of ADT	69.0%
		check	100.0%

Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	805	146	951	71.6
7pm-10pm	32	0	32	2.4
10pm-7am	269	76	345	26.0
check	1106	222	1328	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. n.o. Tamarisk Lake	Existing Conditions	Alt 1&2 2012	Delta
ADT	108	330	222
MD-Truck % of ADT	20.4%	24.8%	
HD-Truck % of ADT	6.5%	21.5%	
MD-Trucks	22	82	60
HD-Trucks	7	71	64
Autos	79	177	98

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. n.o. Tamarisk Lake	**Existing**	**Project**	**E+P**
MD-Trucks	23	0	23
HD-Trucks	3	104	107
Autos	93	446	539
TOTAL	119	550	669
		MD-Truck % of ADT	3.4%
		HD-Truck % of ADT	16.0%
		Auto % of ADT	80.6%
		check	100.0%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	98	362	460	68.8
7pm-10pm	4	9	13	1.9
10pm-7am	17	179	196	29.3
check	119	550	669	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Kaiser Road North of Lake Tamarisk

Distance: >15m Ref:	15.0	(m)
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)
Speed:	45	(mph)
	72	(kph)

Vehicle Distribution Fractions

HD Tks	MD Tks	Autos	
19.19	9.32	71.49	Fraction
82.1	77.8	69.3	REMEL (dBA)

Number of Hours: (hrs)

7am-7pm	7pm-10pm	10pm-7am
12	3	9

Backgd Traffic: (%)

7am-7pm	7pm-10pm	10pm-7am
67.7	1.5	30.9

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	891	89.1	50.3	4.3	30.6	63.99	61.50	50.86	59.34	66.0	*57.3*	*123.5*	*266.1*

CUMULATIVE

Kaiser Rd. n.o. Tamarisk Lake	**E+P**	**Desert Sunlight**	**E+P+DS**
MD-Trucks	23	60	83
HD-Trucks	107	64	171
Autos	539	98	637
TOTAL	669	222	891
		MD-Truck % of ADT	9.3%
		HD-Truck % of ADT	19.2%
		Auto % of ADT	71.5%
		check	100.0%

Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	460	143	603	67.7
7pm-10pm	13	0	13	1.5
10pm-7am	196	79	275	30.9
check	669	222	891	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Appendix G.1

Approach to Baseline Analysis

Appendix G-1

SECTION 1 - Approach to Baseline Analysis Under the BLM Visual Resource Management (VRM) System

The Federal Land Policy and Management Act of 1976 (FLPMA) identifies scenic resources as one of the resources for which public lands should be managed. In order to satisfy its responsibilities with respect to scenic resources, the BLM's Visual Resource Management (VRM) Policy establishes a visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. The BLM manual M-8400 (Visual Resource Management), Handbook H-8410 (Visual Resource Inventory), Handbook H-8431 (Visual Resource Contrast Rating), and Instruction Memorandum 2009-167 (Application of the VRM Program to Renewable Energy) set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance with established objectives for BLM administered public lands.

The three primary elements of the BLM's VRM Policy are: (1) determining resource values, (2) establishing management objectives, and (3) evaluating the conformance of proposed actions with those objectives (each of which is described briefly below).

- ***Determining Resource Values:*** The primary means to establish visual resource values is through a Visual Resource Inventory (VRI) that results in the assignment of one of four VRI Classes (I to IV) to represent the relative visual value of an area. VRI Class I has the highest value and VRI Class IV has the lowest. VRI Class I is reserved for special congressional designations or administrative decisions such as Wilderness Areas, visually sensitive ACECs, or Wild and Scenic Rivers, etc. VRI Classes II through IV are determined through a systematic process that documents the landscape's scenic quality, public sensitivity and visibility. Rating units for each of the three factors are mapped individually, evaluated, and then combined through an over-layering analysis. The three factors contributing to the VRI Class determination are described below. The combined factors are then cross-referenced with the VRI Matrix to determine the applicable VRI Class. VRI classes are informational in nature and provide a baseline for existing conditions. They do not establish management direction and should not be used as a basis for constraining or encouraging surface disturbing activities. They provide the baseline data for existing conditions.
- ***Establishing Management Objectives***: VRM Classes (defined below) are determined through careful consideration of VRI Class designations (visual values), land use and demands, and the resource allocations and/or management decisions made in the applicable land use plan for a given area. VRM Class designations set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape. VRI Classes are not intended to automatically become VRM Class designations. VRM Classes may be different then the VRI Classes assigned during the inventory, as the former should reflect a balance between the protection of visual values and other resource use needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction or its designation as a utility corridor.

- *Evaluating Conformance:* Finally, proposed plans of development are evaluated for conformance to the VRM Class objectives through the use of the Visual Resource Contrast Rating process set forth within BLM Handbook H-8431-1.

Factors Contributing to VRI Class Determination

VRI Class determination is based on an assessment of scenic quality, viewer sensitivity, and viewing distance zones. The following paragraphs address each of these contributing factors.

Scenic Quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity) and built features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable form, line, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. Table G-1-1 presents the scenic quality rating components that are evaluated to arrive at one of three scenic quality ratings (A, B, or C) for a given landscape. Each landscape component is scored, and a score of 19 or higher results in a Class A scenic quality rating. A score of 12 to 18 results in a Class B scenic quality rating, while a score of 11 or less results in a Class C scenic quality rating. The three scenic quality classes are described as follows:

- **Scenic Quality Class A** – Landscapes that combine the most outstanding characteristics of the region.
- **Scenic Quality Class B** – Landscapes that exhibit a combination of outstanding and common features.
- **Scenic Quality Class C** – Landscapes that have features that are common to the region.

Viewer Sensitivity is a factor used to represent the value of the visual landscape to the viewing public, including the extent to which the landscape is viewed. For example, a landscape may have high scenic qualities but be remotely located and, therefore, seldom viewed. Sensitivity considers such factors as visual access (including duration and frequency of view), type and amount of use (See Table G-1-2), public interest, adjacent land uses, and whether the landscape is part of a special area (e.g., California Desert Conservation Area [CDCA] or Area of Critical Environmental Concern). The three levels of viewer sensitivity can generally be defined as follows.

- **High Sensitivity.** Areas that are either designated for scenic resources protection or receive a high degree of use (includes areas visible from roads and highways receiving more than 45,000 visits [vehicles] per year). Typically within the foreground/middleground (f/m) viewing distance (see Table G-1-3).
- **Medium Sensitivity.** Areas lacking specific, or designated, scenic resources protection but are located in sufficiently close proximity to be within the viewshed of the protected area. Includes areas that are visible from roads and highways receiving 5,000 to 45,000 visits (vehicles) per year. Typically within the background (b) viewing distance (see Table G-1-3).
- **Low Sensitivity.** Areas that are remote from populated areas, major roadways, and protected areas or are severely degraded visually. Includes areas that are visible from roads and highways receiving less than 5,000 visits (vehicles) per year.

All of the BLM lands in the vicinity of the proposed project and alternatives are located within the CDCA. Because of the public importance imparted by this designation, BLM lands within the CDCA are generally assigned a High rating for Viewer Sensitivity.

Viewing Distance Zones. Landscapes are generally subdivided into three distance zones based on relative visibility from travel routes or observation points (see Table G-1-3). The f/m zone includes areas that are less than three to five miles from the viewing location. The f/m zone defines the area in which landscape details transition from readily perceived to outlines and patterns. The b zone is generally greater than five, but less than 15, miles from the viewing location. The b zone includes areas where landforms are the most dominant element in the landscape, and color and texture become subordinate. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark. The seldom-seen (s/s) zone includes areas that are usually hidden from view as a result of topographic or vegetative screening or atmospheric conditions. In some cases, atmospheric and lighting conditions can reduce visibility and shorten the distances normally covered by each zone (BLM 1986b).

Table G-1-1. Scenic Quality Rating

Component	Scenic Quality Rating		
Landform	High vertical relief (prominent cliffs, spires, or massive rock outcrops); severe surface variation; highly eroded formations (major badlands or dune systems); detail features dominant and exceptionally striking/intriguing. 5	Steep canyons, mesas, buttes, cinder cones, and drumlins; interesting erosional patterns or variety in size and shape of landforms; or detail features, which are interesting though not dominant or exceptional. 3	Low rolling hills, foothills, or flat valley bottoms or few or no interesting landscape features. 1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. 5	Some variety of vegetation but only one or two major types. 3	Little or no variety or contrast in vegetation. 1
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. 5	Flowing, or still, but not dominant in the landscape. 3	Absent or present but not noticeable. 0
Color	Rich color combinations; variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. 5	Some intensity or variety in colors and contrast of the soil, rock, and vegetation but not a dominant scenic element. 3	Subtle color variations, contrast, or interest; generally muted tones. 1
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. 5	Adjacent scenery moderately enhances overall visual quality. 3	Adjacent scenery has little or no influence on overall visual quality. 0
Scarcity	One of a kind, unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. 5+*	Distinctive, though somewhat similar to others within the region. 3	Interesting within its setting but fairly common within the region. 1
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. 2	Modifications add little or no visual variety to the area and introduce no discordant elements. 0	Modifications add variety but are very discordant and promote strong disharmony. - 4
Scenic Quality Rating:	**A = 19 or more**	**B = 12 to 18**	**C = 11 or less**

* A rating of greater than 5 can be given but must be supported by written justification

Table G-1-2. Amount of Use Classifications

Type Area	High	Moderate	Low
Roads & Highways	More than 45,000 visits/yr	5,000 to 45,000 visits/yr	Less than 5,000 visits/yr
Rivers & Trails	More than 20,000 visits/yr	2,000-20,000 visits/yr	Less than 2,000 visits/yr
Recreation Sites	More than 10,000 visitor-days/yr	2,000-10,000 visitor-days/yr	Less than 2,000 visitor-days/yr

Table G-1-3. Distance Zones

f/m (foreground/middleground)	0 to 3–5 miles
b (background)	5-15 miles
s/s	seldom seen areas

Visual Resource Inventory Classes. The VRI class for a given area is typically arrived at through the use of a classification matrix similar to that presented in Table G-1-4. By comparing the scenic quality, visual sensitivity, and distance zone, the specific VRI class can be determined. The exception to this process is the Class I designation, which is placed on special areas where management activities are restricted (e.g., wilderness areas).

Table G-1-4. Visual Resource Inventory (VRI) Classification Matrix

Visual Sensitivity Levels		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III* IV*	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
Distance Zones		f/m	b	s/s	f/m	b	s/s	s/s

* If adjacent areas are Class III or lower, assign Class III; if higher, assign Class IV.

The objectives of each VRI classification as stated in the BLM *Visual Resource Inventory Manual* are as follows.

- **VRI Class I.** The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **VRI Class II.** The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRI Class III.** The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or lower. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRI Class IV.** The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

Approach Under the CDCA Plan

According to BLM policy (BLM Manual H-8410-1) Interim Visual Resource Management (VRM) classes are established where a project is proposed and there are no approved VRM objectives in the applicable land use plan, as is the case for the DHSP project site which is governed by the CDCA Plan. These interim classes must 1) consider the area's visual values as summarized in the latest visual resource inventory results and 2) be consistent with the multiple-use objectives and use allocations set forth in the plan which covers the project area. While a comprehensive plan amendment is underway (Desert Renewable Energy Conservation Plan) which will establish long-term VRM classifications for the entire CDCA Plan area, the CDCA Plan currently does not have established VRM objectives. Therefore, until this landscape-level plan amendment is completed the BLM is establishing interim VRM classes consistent with H-8410-1 for project level actions within the CDCA planning area, such as the DHSP.

An analysis of scenic quality, viewer sensitivity and distance zones in the most recent Visual Resource Inventory (VRI) for the project area concluded that the inventory class is VRI II (see above for a complete discussion of VRI). The CDCA plan allocation for the project area is Multiple Use Class (MUC) M, which allows for solar electric facilities. Specific projects must be evaluated through a plan amendment to ensure consistency with all goals and objectives for this class. The conformity of the Proposed Action with the CDCA Plan's Energy Production and Utility Corridors Element Decision Criteria is shown in Table 3.22-2.

Mitigation measures VR-1 through VR-5 will be implemented to minimize the visual impacts of the project. However, the level of contrast with the surrounding landscape will still be high when viewed from a variety of vantage points including elevated viewpoints in surrounding wilderness areas and along I-10. Taking the inventory class into consideration, recent developments that have been undertaken and/or approved in the project area, the employment of mitigation measures, and the project's consistency with the MUC, an interim VRM Class IV has been established for the project area. The objective of this class is "to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic visual elements.

SECTION 2 - Approach to Impact Analysis Under the VRM System

The factors considered in determining impacts on visual resources included: (1) scenic quality of the project site and vicinity; (2) available visual access and visibility, and frequency and duration that the landscape is viewed; (3) viewing distance and degree to which project components would dominate the view of the observer; (4) resulting contrast of the project components or activities with existing landscape characteristics; (5) the extent to which project features or activities would block views of higher value landscape features; and (6) the level of public interest in the existing landscape characteristics and concern over potential changes.

An *adverse visual impact* occurs within public view when: (1) an action perceptibly changes existing features of the physical environment so that they no longer appear to be characteristic of the subject locality or region; (2) an action introduces new features to the physical environment that are perceptibly uncharacteristic of the region and/or locale; or (3) aesthetic features of the landscape become less visible (e.g., partially or totally blocked from view) or are removed. Changes that seem uncharacteristic are those that appear out of place, discordant, or distracting. The degree of the visual impact depends upon how noticeable the adverse change may be. The noticeability of a visual impact is a function of project features, context, and viewing conditions (angle of view, distance, primary viewing directions, and duration of view).

Impacts on visual resources within the study area could result from various activities including structure and line construction, substation construction, establishment of construction staging areas and access roads, and project operation or presence of the built facilities.

CONTRAST ANALYSIS METHODOLOGY

Under the BLM's VRM methodology, the proposed project and alternatives were analyzed for their effects on visual resources using an assessment of the visual contrast within the landscape created by components of the project. Impacts to the inventoried visual resource values and conformance with Interim VRM Class Objectives are evaluated through a contrast rating process described below. The degree to which the proposed action and alternatives adversely affect the visual quality of a landscape is directly related to the amount of visual contrast between the alternative and the existing landscape character. Visual Contrast Ratings were conducted using the BLM's VRM System manuals (BLM 1984, 1986a). The Visual Contrast Rating Forms are provided in Appendix G-4. Under the VRM System, the degree to which a project or activity affects the visual quality of a landscape depends on the visual contrast created between the project components and the major features, or predominant qualities, in the existing landscape. Visual contrast evaluates a project's consistency with the visual elements of form, line color, and texture already established in the viewshed. In a sense, visual contrast indirectly indicates a particular landscape's ability to absorb a project's components and location without resulting in an uncharacteristic appearance. Other elements that are considered in evaluating visual contrast include the degree of natural screening by vegetation and landforms; placement of structures relative to existing vegetation, landforms and other structures; distance from the point of observation; and relative size or scale of a project. Once the degree of anticipated contrast is determined (ranging from none to strong), a conclusion on the overall level of change is made (ranging from very low to high) and compared to the applicable VRM class objective for a determination of conformance with the Interim VRM Class objectives.

For the DHSP, the applicable Interim VRM Class is **VRM Class IV**. The management objective for VRM Class IV (as previously noted) is as follows:

- **VRM Class IV**. The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

BLM's VRM Policy does not require VRM Classes to be used as a method to preclude all other resource development. However, it does require that visual values be considered and that those considerations be documented as part of the decision-making process, and that if resource development/extraction is approved, a reasonable attempt must be made to meet the VRM objectives for the area in question and to minimize the visual impacts of the proposal. Because the CDCA Plan does not have Resource Management Plan-approved VRM objectives, a land use plan amendment is not necessarily required to address instances of non-conformance. Nevertheless, the overall goal remains minimizing visual impacts through mitigation measures. In addition to the permanent visual contrast created in the landscape, the proposed action and alternatives are analyzed for adverse effects due to lighting and glare, visible dust plumes, as well as temporary construction-related disturbances.

VISUAL SIMULATIONS

To prepare the visual simulations for each KOP, appropriately scaled polygons were first constructed in Google Earth at each structure location. A Google Earth perspective view was then achieved to match a KOP existing view photograph. The perspective view image was then layered with the existing view image and the constructed polygons were used as guides for appropriately scaling and placing individual wind turbine images into the existing view photograph, which was then saved as the simulation image. A similar process was used for the access roads.

MITIGATION APPROACH

Mitigation for visual resources impacts resulting from energy infrastructure and similar types of industrial facilities typically focuses on methods to minimize the visibility of the resulting visual change either by screening the change from view or by blending the change with the background (by selective use of coloration and/or screening). By their very nature, transmission structures tend to be large and exposed, and thus, difficult to either hide from view or blend into the background. Also problematic is the grading associated with the solar facility construction, and construction of permanent access and structure spur roads and "temporary" cleared areas that become persistent in arid and semi-arid landscapes where vegetation recruitment and growth are slow. These features often cause unnatural and discordant demarcations in the vegetation landscape that increase the visual contrast of project activities.

However, in some cases there are techniques that can reduce the prominence of land scarring and vegetation changes though they may not reduce the impact. The following techniques were considered where appropriate for the proposed project and alternatives:

- Require revegetation and restoration efforts to mitigate the unnatural demarcation in vegetation landscapes caused by removal of or changes in the vegetation within the project area as a result of clearing and maintenance.
- Consider alternative low-impact construction techniques to minimize prominent land scarring visible to sensitive viewpoints.

For each of the visual impacts identified, the mitigation approaches discussed above were evaluated for applicability and likelihood of success. In almost all cases, the combination of existing landscape characteristics and structure prominence and visibility resulted in impacts that could not be mitigated. However, where mitigation opportunities were identified, they are discussed.

References

U.S. Department of the Interior, Bureau of Land Management (BLM). 1986. *Visual Resource Inventory Manual H-8410-1*.

_____. 1986. *Visual Resource Contrast Rating Manual 8431*.

_____. 1984. *Visual Resource Management Manual 8400*.

_____. 1980, as amended 1999. *California Desert Conservation Area Plan*.

TRUESCAPE
CONSULTING & VISUAL FACILITATION

Statement of Methodology of Truescape Limited

On behalf of

enXco

Desert Harvest Solar Farm

August - 2012

1. TRUESCAPE CREDENTIALS

1.1 Truescape has over 16 years of experience working in the 3D Photo and Video Simulations industry. Truescape has completed a wide range of different visualisation projects from photo-simulations for simple projects to full computer generated 3D video simulations for complex projects. Truescape's client base spans many industry sectors such as solar, wind, transmission and generation across New Zealand, Australia, and the US.

1.2 Truescape adopts a team approach for project completion as each type and phase of a project calls for a different mix of specialised skill sets. This expertise spans many disciplines including photography, engineering, architecture, surveying, landscape architecture, 3D computer modelling, evidence preparation and presenting evidence as expert witnesses. All members of our staff have either formal qualifications or have undergone professional training and have direct experience working in each these specialised areas.

1.3 Truescape simulations have been produced as evidence in forums such as the New Zealand Environment and High Courts, Australia's Victorian Civil and Administrative Tribunal, the Supreme Court and the Connecticut Siting Council. Members of Truescape's staff have presented evidence as expert witnesses in these Courts, where our work has been subjected to cross-examination and accepted as evidence.

1.4 Truescape has assisted in providing survey controlled simulations for the following developments:

- 2003 – Meridian Energy, Te Apiti Farm, Council Hearing;
- 2004 – Meridian Energy, White Hill Farm, Council Hearing;
- 2004 – Southern Hydro, Dollar Wind Farm South Australia, Panel Hearing;
- 2005 – Genesis Energy, Awhitu Wind Farm, Environment Court;
- 2005 – Unison Energy, Hawkes Bay Wind Farm, Environment Court;
- 2006 – Meridian Energy, Project West Wind, Environment Court;
- 2006 – Acciona Energy, Wind Farm South Australia, Panel Hearing;
- 2007 – Invenergy, Moresville Wind Energy Park, New York; USA Permitting Hearing;

- 2008 – Bluewater Wind, Offshore Wind Farm, Maryland, USA; Permitting Hearing;
- 2008 – Bluewater Wind, Offshore Wind Farm, New Jersey, USA; Permitting Hearing
- 2008 – BP Alternative Energy – White Pines Project, Michigan, USA; Permitting
- 2008 - Meridian Energy, Project Mill Creek, Council Hearing
- 2008 – Meridian Energy, Project Hayes, Environment Court;
- 2009 – Meridian Energy; Project Central Wind; Environment Court
- 2010 – WestWind Energy, Australia, Permit Application;
- 2010 – Pacific Hydro; Australia, Panel Hearing;
- 2011 – AltaLink, Heartland Transmission Project; Alberta Utilities Commission (AUC) Hearing, Alberta Canada

2. SCOPE OF STATEMENT

2.1 enXco engaged Truescape in June 2012 to provide:

- Three animated time-lapse simulations from three pre-determined Key Observation Points (KOP) depicting how the proposed "Desert Harvest Solar Farm" would look under the climatic conditions that were experienced when capturing the photography. First Solar's neighbouring "Desert Sunlight Solar Farm" was modelled and shown in the simulations at its stage of completion.
- Truescape spent a considerable amount of time on site to capture photography for this project. The atmospheric conditions over several days however did not allow Truescape to capture photography of high enough clarity suitable to simulate potential glare of the solar farm from a third KOP at a distance of approx. 8 miles from the project. The timeframe did not allow Truescape to capture and prepare a third time-lapse simulation from this point to support the visual assessment. Truescape focussed on completing the two KOPs from approx. 4 miles and approx. 5 miles distance to the project (see KOP map on page 5).

2.2 The scope of Truescape's work does not extend to the assessment or interpretation of the simulations.

2.3 Page 4 provides validation of our methodology with post construction analysis of Project West Wind, a wind farm project in New Zealand.

2.4 We have set out the following in **Appendix A**

- Key Observation Point Locations; (Page 5)
- Deliverables; (Page 6)
- An overview of the animated Time-lapse Simulation; (Page 7)
- Methodology; (Pages 8 -12)
- Model Input Data used to create the simulations; (Pages 13-17)

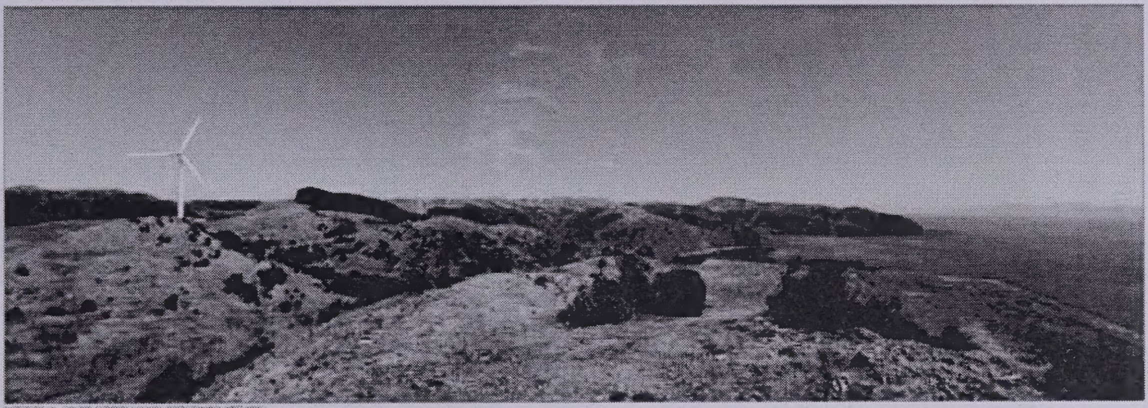
3 SUMARY AND CONCLUSION

3.1 The Time-lapse Simulations have been created using a robust methodology. The time-lapses depict how the proposed project will be experienced during the course of an entire day and accurately reflect the correct sunlight and climatic conditions experienced at the time of photography.

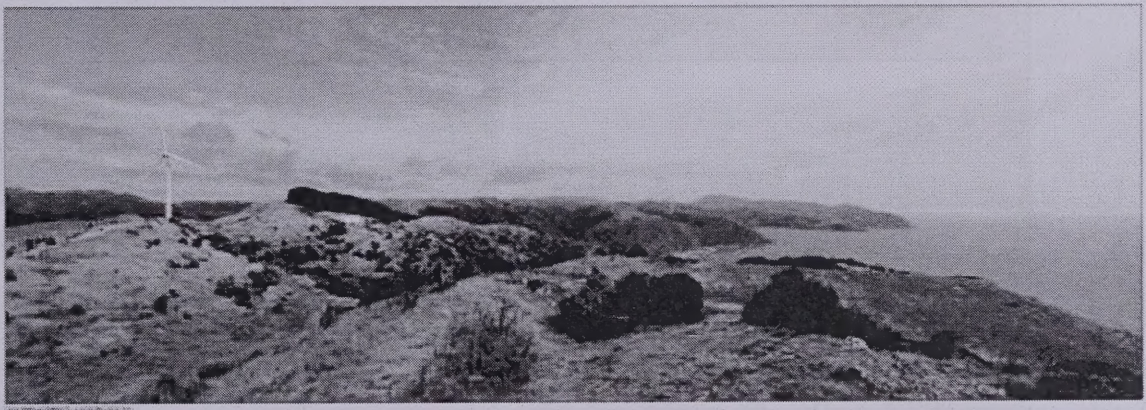
VALIDATION OF THE TRUESCAPE METHODOLOGY

4.1 We have attached below some post construction analysis of the Project West Wind wind farm that compared a simulation against the completed project. This comparison demonstrates the accuracy of the TrueView methodology. In particular, it can be seen that the size and placement of the turbines in this simulation is identical to the wind farm that was constructed. It should be noted that the turbines in the simulation seem more obvious than the actual turbines in the photograph due to the atmospheric conditions experienced on the day the photograph was taken.

4.2 The simulation and photograph were produced 2 years and 7 days apart and both are taken at the same time of day so as to produce the same lighting and shadow conditions.



SIMULATION OF PROJECT WEST WIND PRE CONSTRUCTION (February 2008)



PHOTOGRAPH OF PROJECT WEST WIND POST CONSTRUCTION (February 2010)

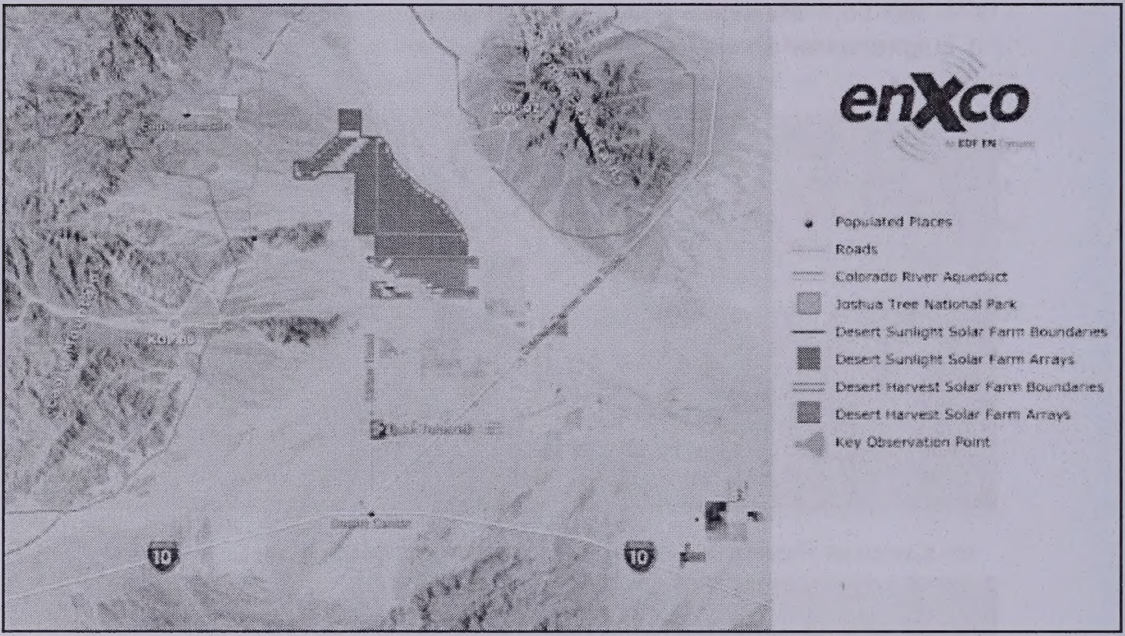
4.3 The methodology by which the enXco "Desert Harvest Solar Farm" Time-lapse Simulations were created is based upon the same survey accurate technology that was used to create the simulation above.

APPENDIX A

KEY OBSERVATION POINT LOCATIONS

- Location map depicting key observation point (KOP) locations and orientation of view (orange cones) used for the animated time-lapse simulations.

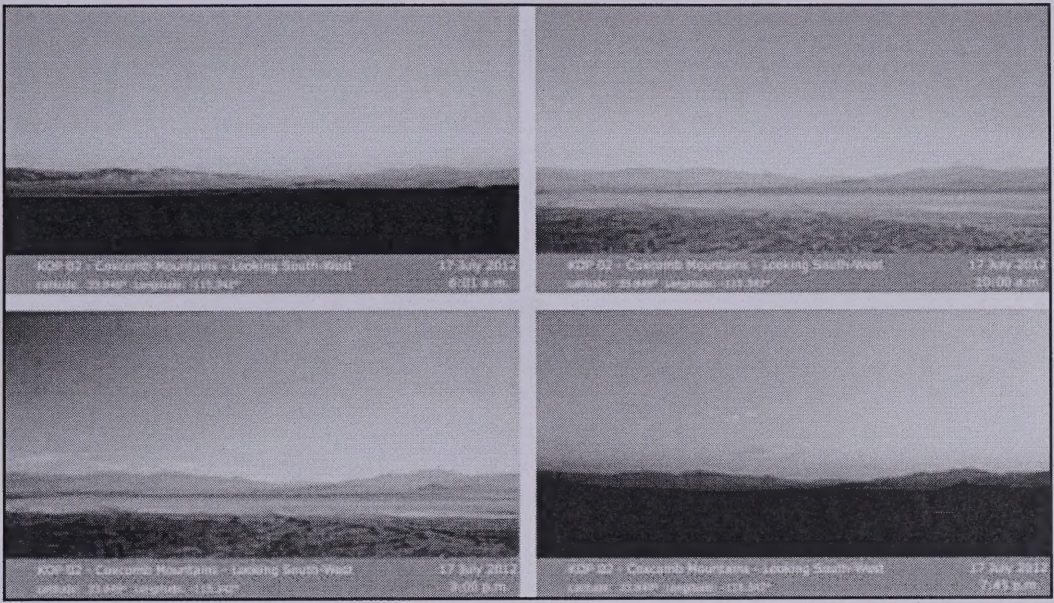
- To provide overall project context, First Solar's "Desert Sunlight Solar Farm" is depicted as well.


KOP 02
KOP 09
Lake Tamarisk
Desert Center
10
10
enXco
Populated Places
Roads
Colorado River Aqueduct
Joshua Tree National Park
Desert Sunlight Solar Farm Boundaries
Desert Sunlight Solar Farm Arrays
Desert Harvest Solar Farm Boundaries
Desert Harvest Solar Farm Arrays
Key Observation Point

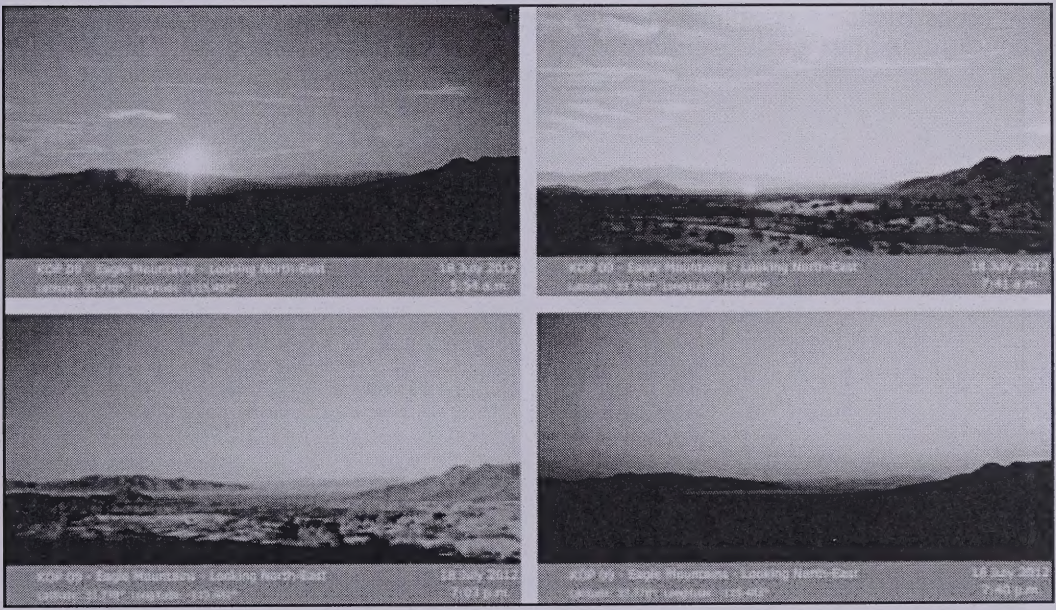
- KOP 02 – Coxcomb Mountains – looking South-West
- KOP 09 – Eagle Mountains – looking North-East

DELIVERABLES

Digital Windows-Media-Video (WMV) files of the animated time-lapse simulations were delivered for each of the Key Observation Points (KOP). The images below are still images from the final animated time-lapse simulations, each representing 4 different moments during the course of a day.


KOP 02 - Coxcomb Mountains - Looking South-West
17 July 2012
6:01 a.m.
KOP 02 - Coxcomb Mountains - Looking South-West
17 July 2012
10:00 a.m.
KOP 02 - Coxcomb Mountains - Looking South-West
17 July 2012
9:00 p.m.
KOP 02 - Coxcomb Mountains - Looking South-West
17 July 2012
7:43 p.m.

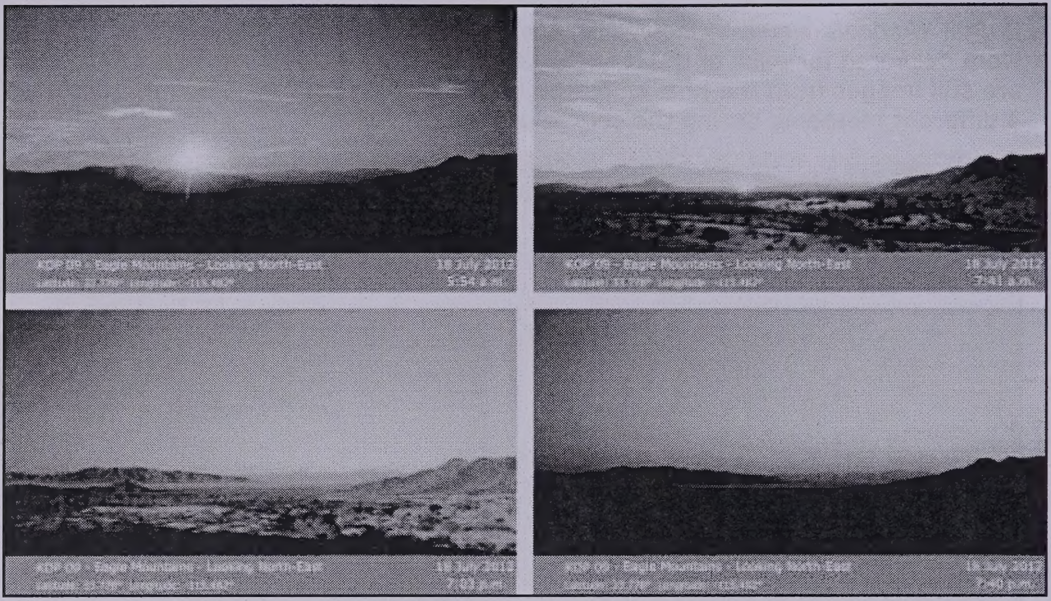
- KOP 02 – Coxcomb Mountains – looking South-West


KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
5:54 a.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:41 a.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:03 p.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:40 p.m.

- KOP 09 – Eagle Mountains – looking North-East

As outlined under paragraph 2.1 on page 3, a time-lapse simulation from a third KOP could not be completed due to time and weather constraints.

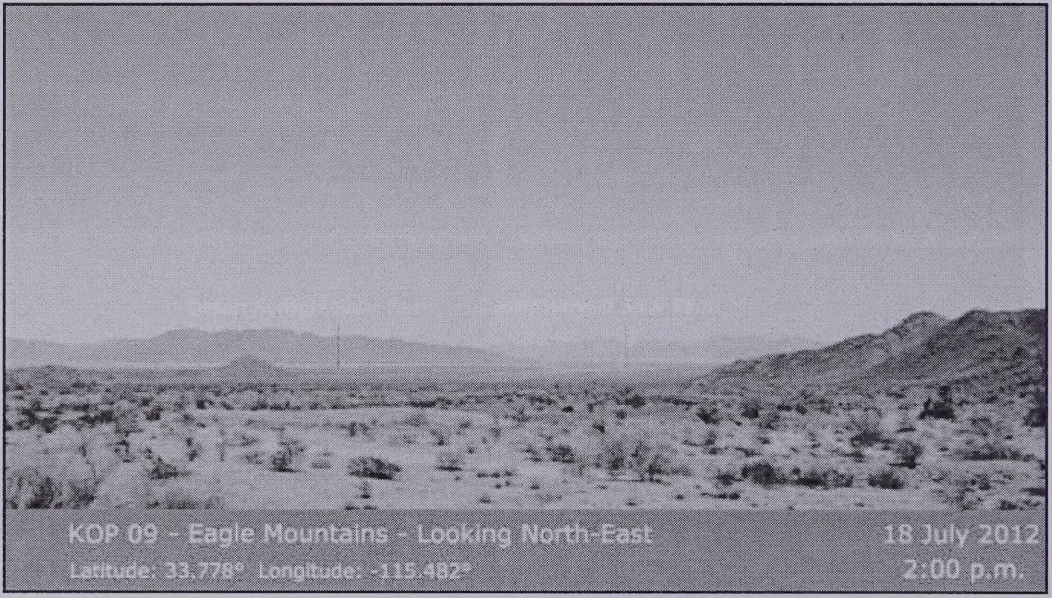
TIME-LAPSE SIMULATION


KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
5:54 a.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:41 a.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:03 p.m.
KOP 09 - Eagle Mountains - Looking North-East
18 July 2012
7:40 p.m.

- A Time-lapse Simulation depicts how a proposed project will be experienced during the course of an entire day, and accurately reflects the exact sunlight and climatic conditions experienced at the time of photography.

- Capturing a photograph every 15 sec during the course of an entire day allows differing light and climatic conditions to be accurately communicated.

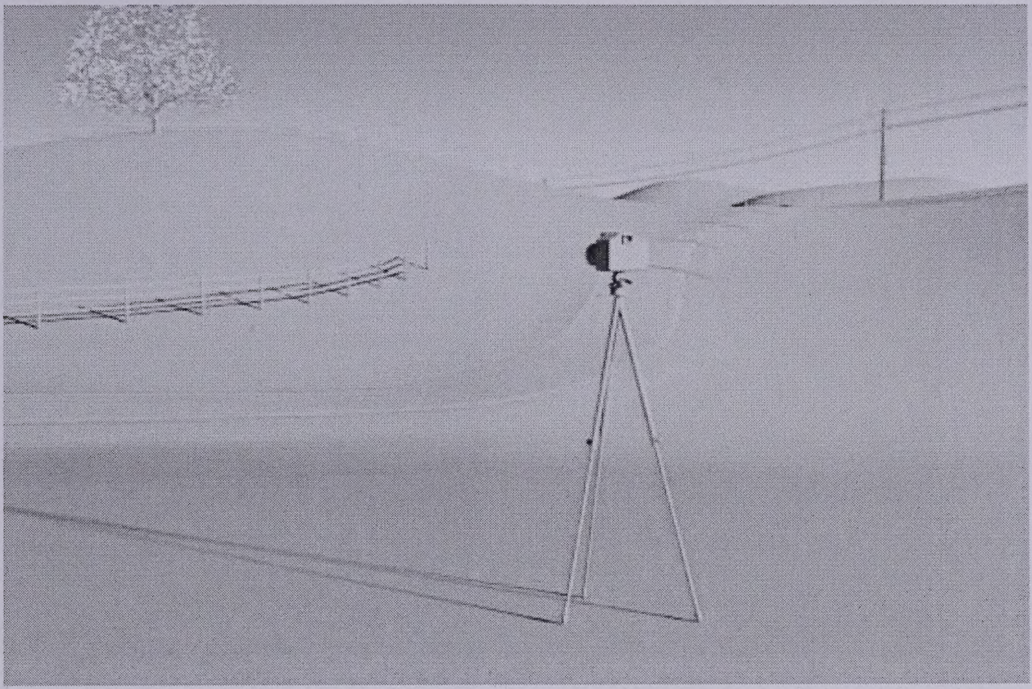
- First Solar's neighbouring "Desert Sunlight Solar Farm" – currently under construction – is simulated at its state of completion.


KOP 09 - Eagle Mountains - Looking North-East
Latitude: 33.778° Longitude: -115.482°
18 July 2012
2:00 p.m.

- An occasional colour overlay of project boundaries and labelling allows distinguishing between the two projects depicted.

METHODOLOGY

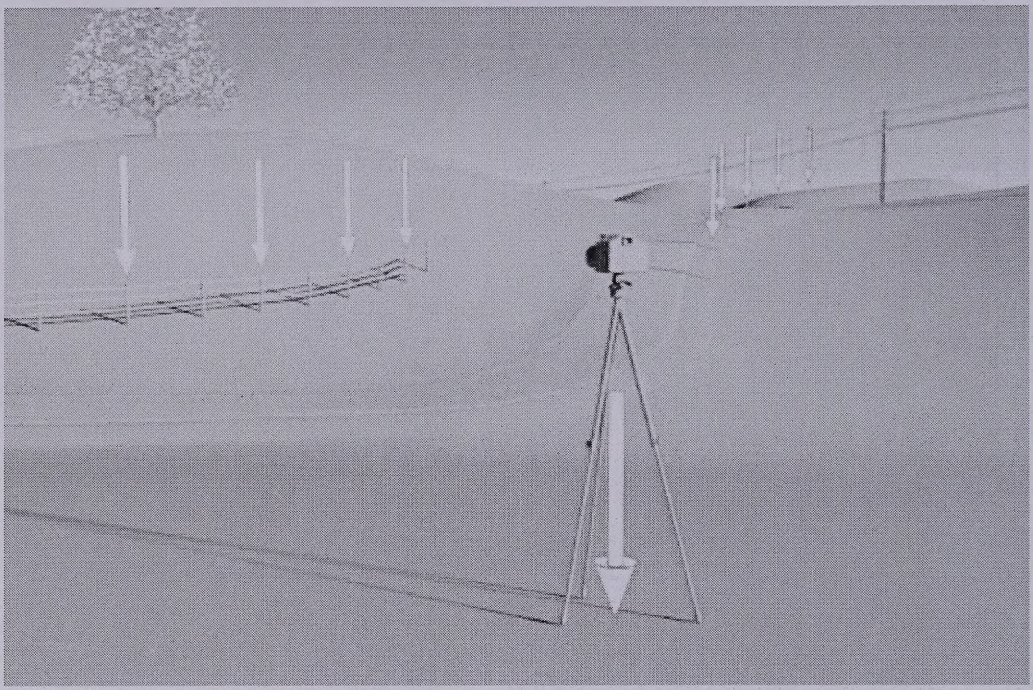
The Site Visit



- The site visit is undertaken to capture the necessary photographs and ground mark the photo point position and identify additional reference points to enable the surveyor to survey fix the exact location of the camera.
- A digital SLR 1:1 21 mega pixel camera is used to take the photography. This camera produces photographs at a resolution and clarity as good as current technology will allow when generating simulations.

METHODOLOGY

Capturing the surveyed reference points

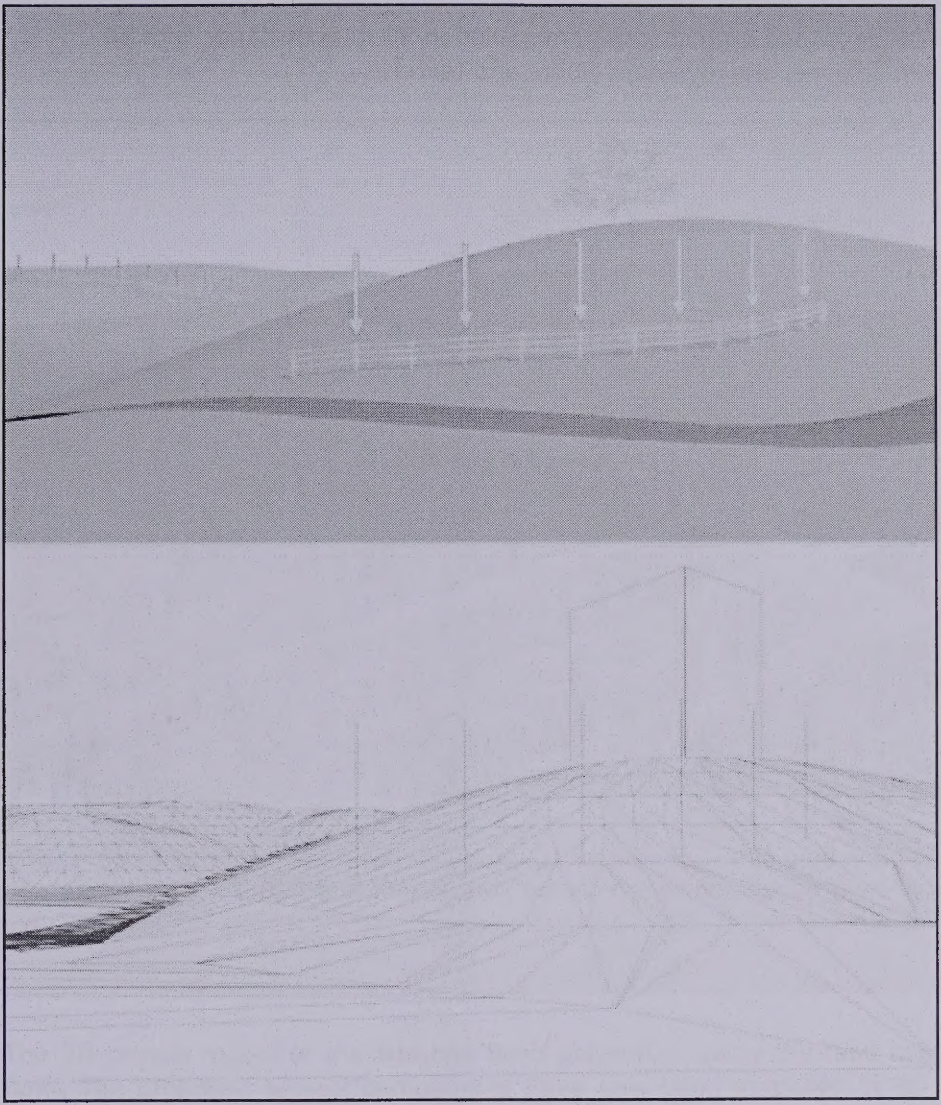


- To accurately create an animated time-lapse video simulation the exact position of the camera is survey fixed by a registered surveyor.

- Additional reference points are identified during the site visit so that the 3D model can be accurately placed into the photo stream. These reference points include things like fences, vegetation, or temporary markers placed in the scene. The surveyor is directed to each of these points.

METHODOLOGY

Aligning the surveyed reference points

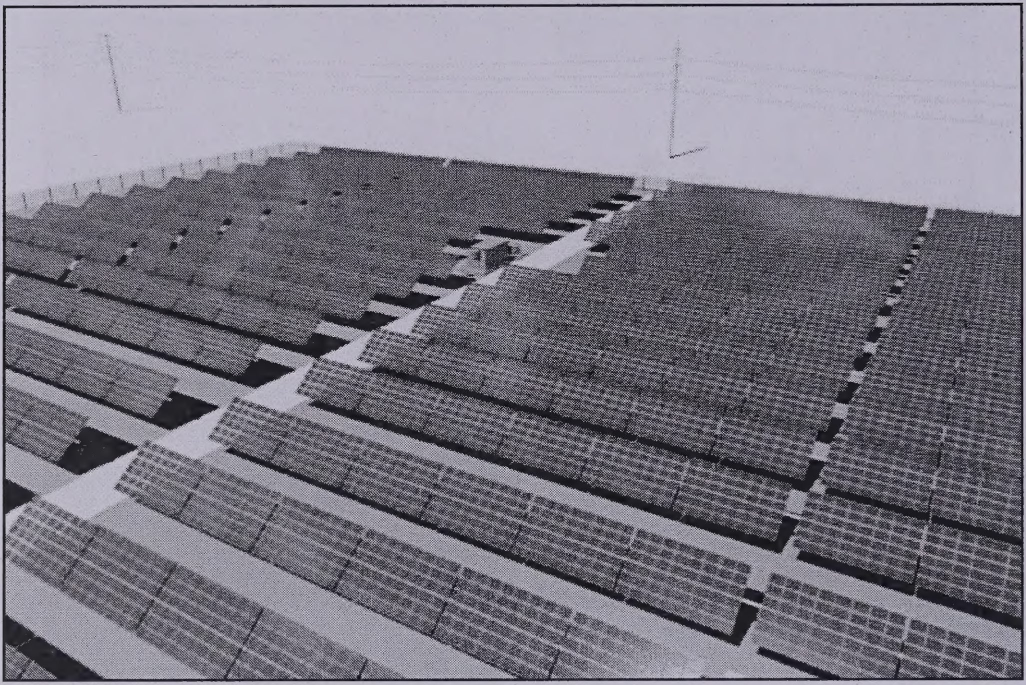


- The next step is to construct the 3D computer model. Using Autodesk® 3ds Max® 3D computer simulation software the survey fixed photo and reference points are imported into the 3D model. A "computer camera" is created to simulate the camera that captured the original photographs, including matching the focal length. The simulated "computer camera" is then positioned at the same survey coordinates as the physical observation point position.
- The photographs are then incorporated into the computer model. This is done by correctly aligning the "computer camera" to match the surveyed reference points to the reference objects, and to the terrain if required.

METHODOLOGY

Building the proposed project in 3D

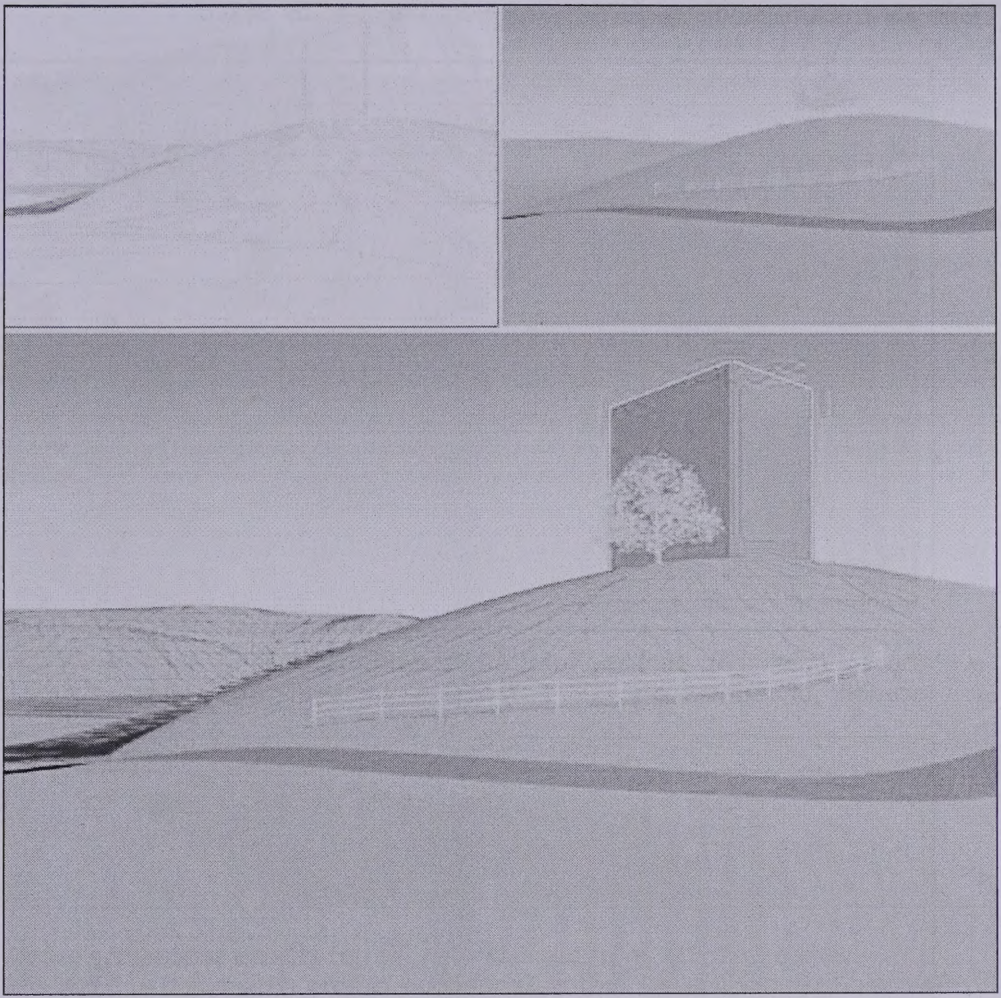
- The proposed project is then modelled in 3D in accordance with all dimensions, site layouts, colours and textures.



- Elevated close-up view of 3D-model of the High Profile 15 foot tracking solar panels, power converter station unit and Gen-Tie transmission line structures.

METHODOLOGY

Building the proposed project in 3D



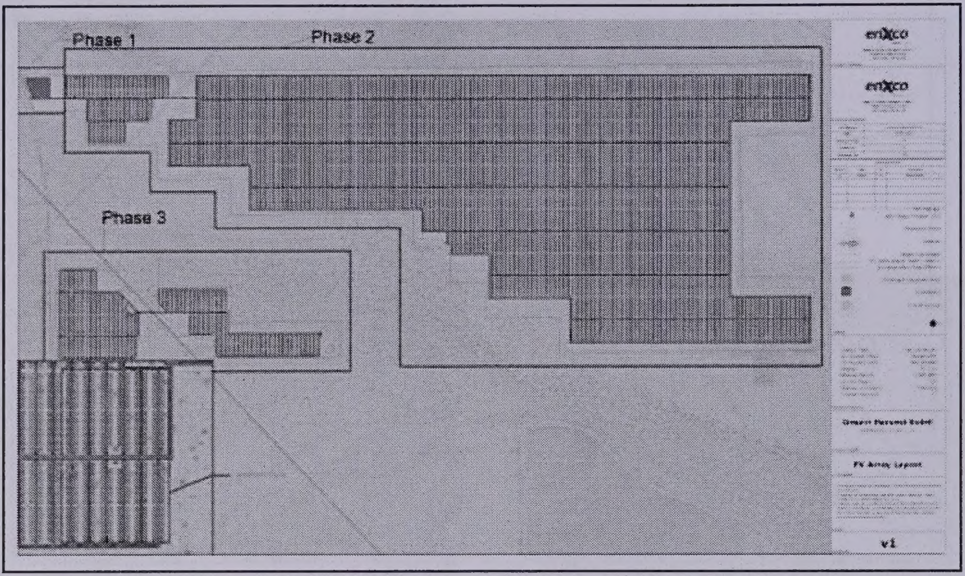
- The 3D terrain model of the site has been generated using the land contour data. The proposed project components have now been modelled in 3D and are imported and positioned accurately into the scene.

- The simulation software allows the sun to be simulated for the precise period of time the original photography was captured for. This ensures the lighting of the solar panels as well as the shadows they cast are an accurate depiction of how the proposed "Desert Harvest Solar Farm" would appear in the photo-stream during the course of that day and reflecting the same climatic conditions as those experienced at the time the photographs were taken.

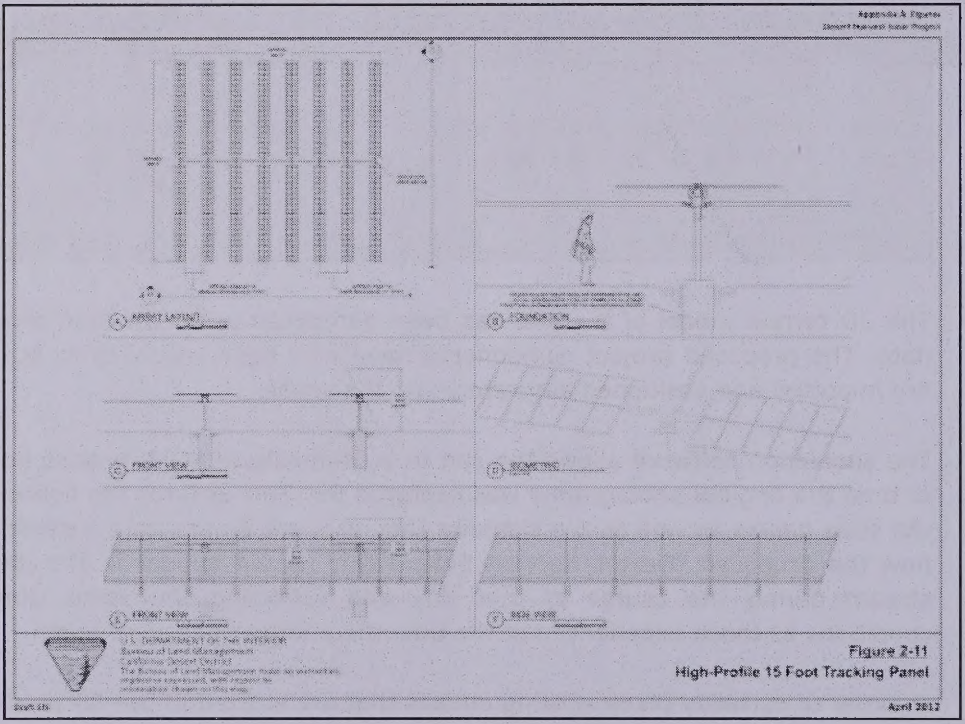
- In order to correctly place existing objects that are in front of the 3D model of the development, these foreground objects are overlaid from the original photographs onto the computer generated image using AfterEffects software.

MODEL INPUT DATA

All data including solar panel layout, dimensions and array placement as well as Gen-Tie transmission structure design were provided by enXco.

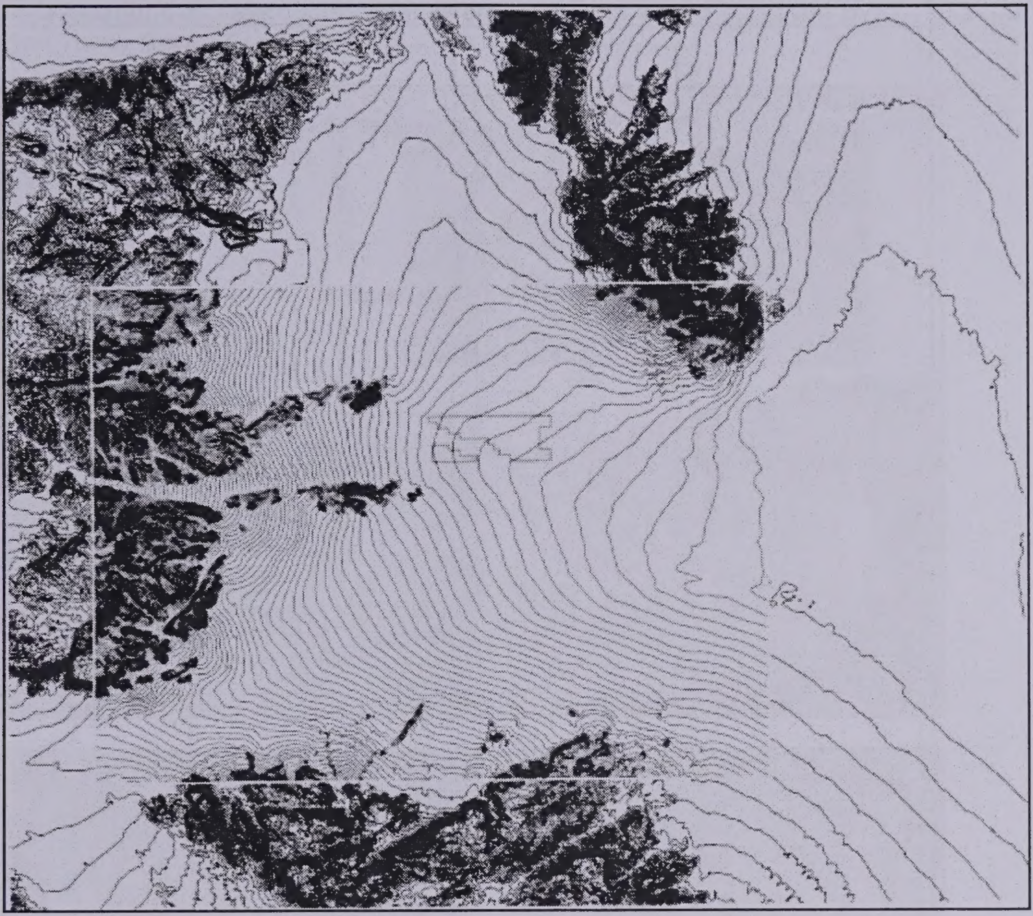


- Above screenshot depicts AutoCAD drawing specifying solar array layout, location of substation, O&M facilities as well as project boundaries.


Appendix A: Figures
Desert Harvest Solar Project
ARRAY LAYOUT
FOUNDATION
FRONT VIEW
ISOMETRIC
FRONT VIEW
SIDE VIEW
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
California Desert District
Figure 2-11
High-Profile 15 Foot Tracking Panel
April 2012

- Above screenshot depicts dimensions and spacing of the high-Profile 15 foot tracking panels as well as details of the security fence.

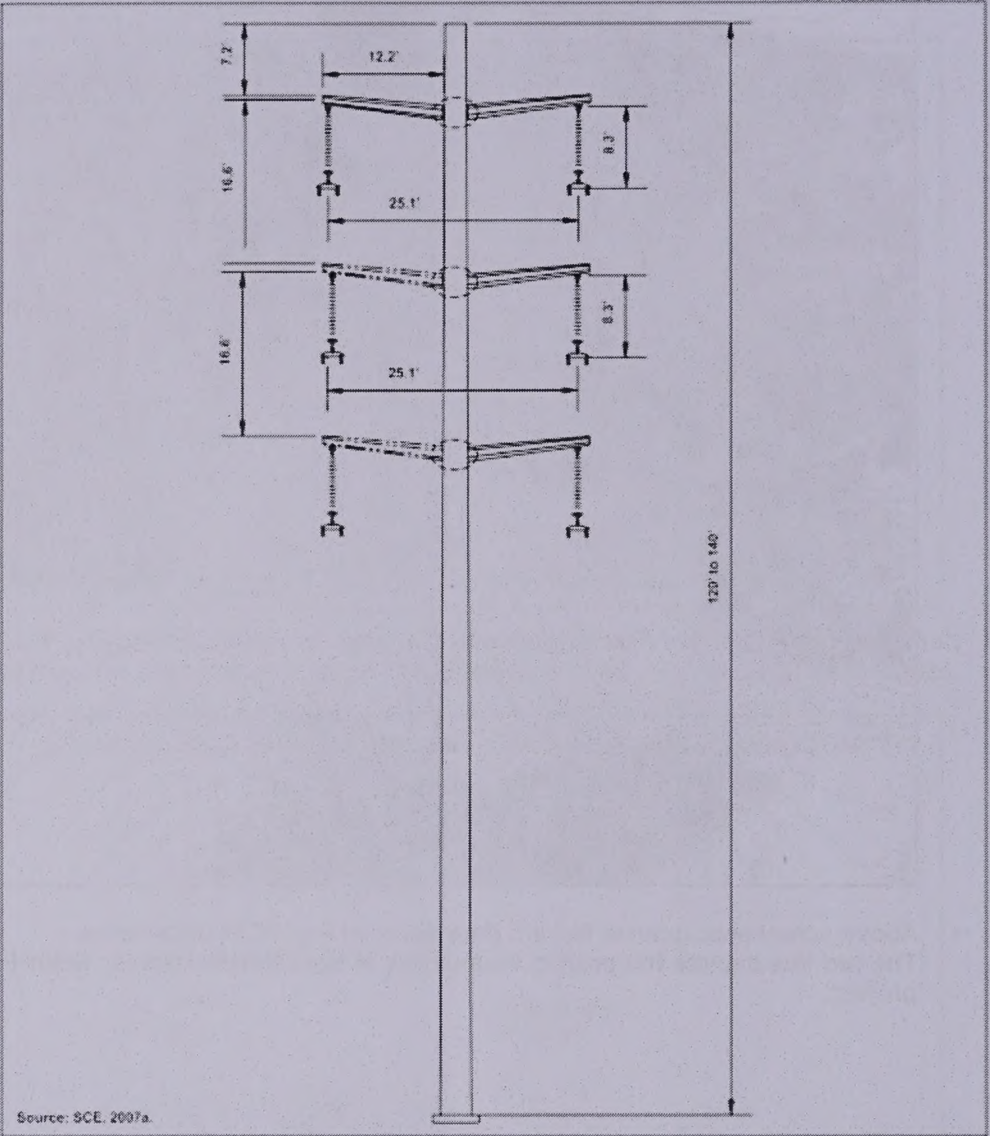
MODEL INPUT DATA



- Above screenshot depicts terrain data sourced from GIS data bases. The red line depicts the project boundaries of the "Desert Harvest Solar Farm" project.

MODEL INPUT DATA

Appendix A. Figures
Desert Harvest Solar Project



Source: SCE, 2007a.

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
California Desert District
The Bureau of Land Management make no warranties, implied or expressed, with respect to information shown on this map.

Figure 2-13a

Typical 220-kV Line Monopole Double-Circuit Tangent Structure

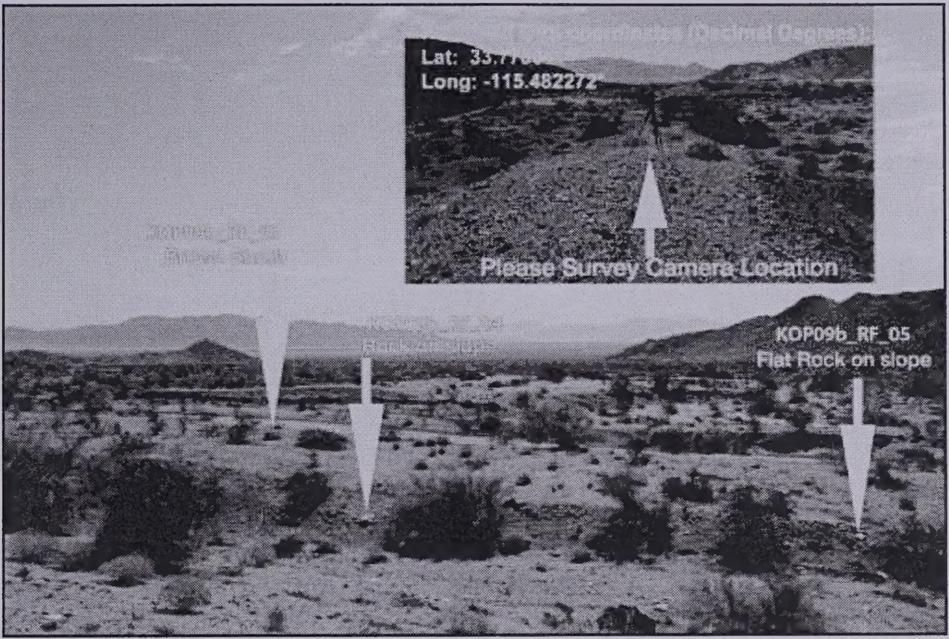
Draft EIS

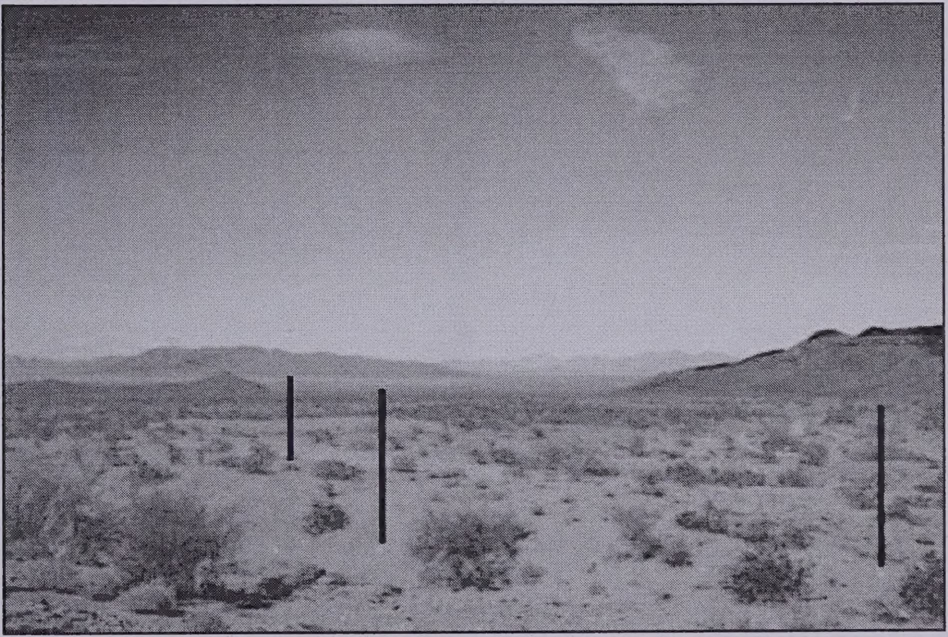
April 2012

- Above drawing depicts type and typical height of the proposed Gen-Tie transmission structures.

MODEL INPUT DATA

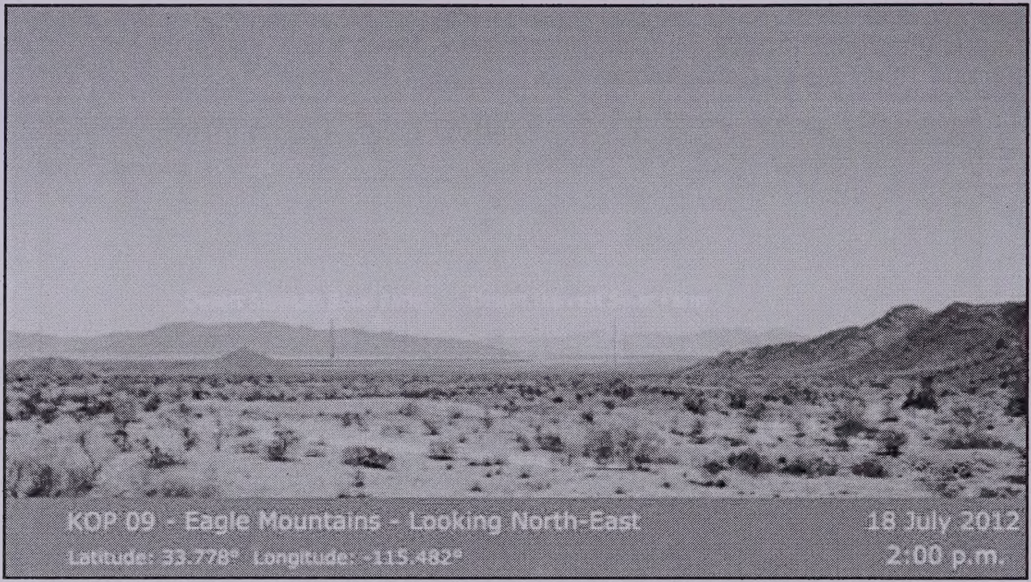
The images below represent alignment of the digital terrain (depicted by red overlay) and 3D-model to the real world photography.
Camera locations including individual reference points where surveyed by:
Section Thirty Seven Consultants.

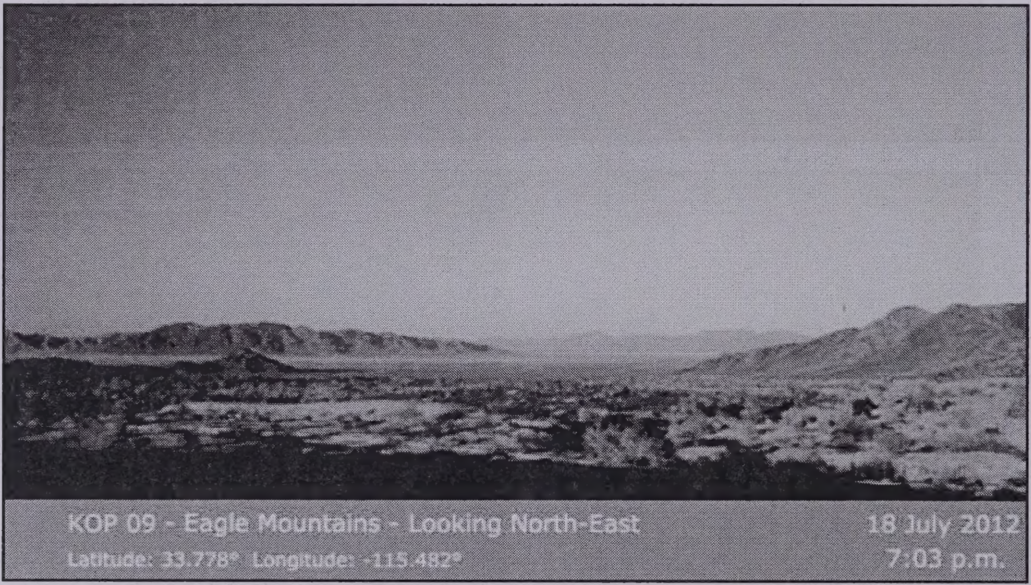




- Using "KOP 09 - Eagle Mountains – looking North-East" as an example these images show reference points depicted by coloured lines which have been requested (yellow arrows), survey fixed (bottom of black cylinders) and were used to accurately position the 3D model of the proposed "Desert Harvest Solar Farm" into the photographs.

Two representative still images of the final animated time-lapse simulation for this Key Observation Point are depicted below.


KOP 09 - Eagle Mountains - Looking North-East
Latitude: 33.778° Longitude: -115.482°
18 July 2012
2:00 p.m.


KOP 09 - Eagle Mountains - Looking North-East
Latitude: 33.778° Longitude: -115.482°
18 July 2012
7:03 p.m.

Appendix G.2

Summary of Key Observation Point Analyses

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
				VRM Class						
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	Status	Rating	Management Objective	Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
KOP 1 Joshua Tree Wilderness – Eagle Mountains Proposed Project Figures 4.19-1A / 1B	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	**Class C** This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains. This location is near an access point to JNP.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Low** The Proposed project would result in the introduction of barely discernible built structures that, at an approximately eight-mile viewing distance, would appear as a low, narrow, light-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements. The resulting structural visual contrast for form, line, color, and texture would be weak (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	**Consistent** The low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6
KOP 2 Joshua Tree Wilderness – Coxcomb Mountains Proposed Project Figures 4.19-2A / 2B	View to the southwest from an elevated vantage point along the western flank of the Coxcomb Mountains, northeast of the project site.	**Class C** This panoramic vista and elevated overlook of the northern Chuckwalla Valley also encompasses the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This elevated view captures the variety of colors that are manifested in the soils, rocks, vegetation, and erosional patterns of the Chuckwalla Valley floor. The angular to low horizontal and rugged forms of the background Chuckwalla and Eagle Mountains provide features of additional visual interest. While some localized areas of ground disturbance are noticeable at this middleground viewing distance, they are not prominent features and the landscape is predominantly natural in appearance, though relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** The Proposed project would result in the introduction of a large-scale complex of built structures and graded surfaces forming a spatially and visually prominent series of geometric patterns on the valley floor, that would contrast with the predominantly natural appearance of the northern Chuckwalla Valley landscape and background Chuckwalla and Eagle Mountains. The color and reflective characteristics of the panel support structures would contribute to the noticeable contrast with existing earthtone colors.	**Consistent** The moderate to high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-1 through VR-6

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT (continued)

VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 3 Kaiser Road in the Immediate Project Vicinity Proposed Project Figures 4.19-3A / 3B	View to the east from Kaiser Road, in the immediate vicinity of the project site.	**Class C** This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the southern extent of the Coxcomb Mountains and the more distant Palen Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** The Proposed Action would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and line contrast of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The color and texture of the solar panels would result in moderate degrees of visual contrast. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class II) AFTER: Less than Significant	VR-1 through VR-6
KOP 4 Desert Lily Sanctuary ACEC Proposed Project Figures 4.19-4A / 4B	View to the west from the Desert Lily Sanctuary ACEC, just east of SR 177.	**Class C** This view encompasses a central portion of the Chuckwalla Valley, backdropped by the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and greens. Also visible is a wood-pole utility line. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Very Low** The Proposed Action would result in the introduction of barely discernible built structures that, at an approximately 5.5 mile viewing distance, and the presence of substantial intervening vegetation, would be barely noticeable along the valley floor. Neither the solar farm nor the transmission line structures would be perceived as prominent features in the landscape, and view impairment of the valley floor or other background landforms would be minimal. The resulting structural form and line contrast would be weak, and there would be no discernible color or texture contrast, when viewed from the Desert Lily Sanctuary ACEC.	**Consistent** The very low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6

APPENDIX G-2
DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT

VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 1A Joshua Tree Wilderness – Eagle Mountains Alternative 7 High-Profile Solar Project Figures 4.19-1A / 1C	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	**Class C** This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains. This location is near an access point to JTNP.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Low** Alternative 7 would result in the introduction of a noticeable horizontal, built feature, which, at an approximately eight-mile viewing distance, would appear as a low, narrow, variably-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements (gen-tie line). The resulting structural visual contrast for form and texture would be weak. For line and color, the resulting visual contrast would be weak to moderate (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	**Consistent** The low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6
KOP 3A Kaiser Road in the Immediate Project Vicinity Alternative 7 High-Profile Solar Project Figures 4.19-3C / 3D	View to the northeast from Kaiser Road, in the immediate vicinity of the project site.	**Class C** This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the Coxcomb Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities, that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**High** Alternative 7 would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and color contrasts of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The line contrast of the solar panels would be strong and the texture contrast would be moderate. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor and background Coxcomb and Palen Mountains.	**Consistent** The high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-1 through VR-6

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT (continued)										
VIEWPOINT		**BLM - EXISTING VISUAL SETTING**					**BLM - VISUAL CONTRAST ANALYSIS**		**CEQA IMPACT SIGNIFICANCE**	
Key Observation Point (KOP)	**Description**	**Scenic Quality Classification**	**Viewer Sensitivity**	**VRM Class**			**Level of Change** (See Appendix G4 Contrast Rating Worksheets)	**VRM Consistency**	**Before Mitigation** **After Mitigation**	**Mitigation**
				Status	**Rating**	**Management Objective**				
KOP 8A **Westbound I-10** **Alternative 7 High-Profile Solar Project** **Figures 4.19-8C / 8D**	View to the northwest from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	**Class C** This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle and Coxcomb Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar array, tubular steel poles, and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate (notably the variable colors of the solar array depending on time of day, orientation of the tracking panels, and characteristics of the reflected sky). Texture contrast would be weak. Also, the solar array and transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Eagle and Coxcomb Mountains.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-1 through VR-6**
ALTERNATIVES B AND C GEN-TIE ROUTES										
KOP 5 **Northbound Kaiser Road Near Lake Tamarisk** **Alternative B and C Gen-Tie Routes** **Figures 4.19-5A / 5B**	View to the north-northwest from northbound Kaiser Road, near the community of Lake Tamarisk.	**Class C** This view toward the open expanse of Chuckwalla Valley west of Kaiser Road and the Eagle Mountains beyond, is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Joshua Tree Wilderness in the Eagle Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**High** This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Eagle Mountains.	**Consistent** The high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-3 and VR-4**

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

VIEWPOINT		BLM – EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
ALTERNATIVE D GEN-TIE ROUTE										
KOP 6 **Eastbound I-10 East of Desert Center** **Alternative D Gen-Tie Route** **Figures 4.19-6A / 6B**	View to the northeast from eastbound I-10, east of Desert Center and approximately 0.8 mile west of the Alternative D Gen-Tie route span of I-10.	**Class C** This view toward the open expanse of Chuckwalla Valley north of I-10, includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Chuckwalla Mountains Wilderness.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**High** This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color and texture contrasts would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Palen Mountains.	**Consistent** The high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-3 and VR-4**
ALTERNATIVE E GEN-TIE ROUTE										
KOP 7 **Northbound SR 177** **Alternative E Gen-Tie Route** **Figures 4.19-7A / 7B**	View to the northeast from northbound SR 177, approximately 0.3 mile southwest of the Alternative E Gen-Tie route span of SR 177.	**Class C** This view toward the Alternative E Gen-Tie route, SR 177 span location, captures a central portion of the northern Chuckwalla Valley where it is bisected by SR 177. The open expanse of valley floor is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), and Joshua Tree Wilderness in the Coxcomb Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking structures of similar scale and industrial or technological character. The associated moderate to strong visual contrast of the tubular steel poles and curvilinear conductors is somewhat moderated by the linear forms and vertical lines of an existing wood-pole utility line adjacent to SR 177. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause considerable view blockage of the background Coxcomb and Palen Mountains.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-3 and VR-4**

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE E GEN-TIE ROUTE (continued)										
VIEWPOINT		**BLM - EXISTING VISUAL SETTING**					**BLM - VISUAL CONTRAST ANALYSIS**		**CEQA IMPACT SIGNIFICANCE**	
Key Observation Point (KOP)	**Description**	**Scenic Quality Classification**	**Viewer Sensitivity**	**VRM Class**			**Level of Change** (See Appendix G4 Contrast Rating Worksheets)	**VRM Consistency**	**Before Mitigation** **After Mitigation**	**Mitigation**
				Status	**Rating**	**Management Objective**				
KOP 8 **Westbound I-10** **Alternative E Gen-Tie Route** **Figures 4.19-8A / 8B**	View to the north from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	**Class C** This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be weak to moderate and texture contrast would be weak to moderate. Also, the transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Coxcomb and Palen Mountains.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: **Significant (Class I)** AFTER: **Same**	**VR-3 and VR-4**

Appendix G.3

Scenic Quality Field Inventory

Form 8400-1
(September 1985)
(Format Modified 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Field Office: Palm Springs D06000 Date: 10/6/2009

Scenic Quality Rating Unit: Chuckwalla Valley Time (24hr format): 11:50

Unit Number: 21

1. Evaluators: CBrandt GLong

2. LANDSCAPE CHARACTER (Features)			
	A. Landform/Water	**B. Vegetation**	**C. Structures**
Form	Broad valley; flat to gentle slopes; very gently rolling	Rounded, clumpy, mottled form	Roads, settlements, substations, power lines, tall cylindrical poles; geometric
Line	Horizontal landscape; vast open space	Rounded, horizontally aligned	Vertical poles, buildings
Color	Light brown to buff-colored soils and rock	Brownish-green	White, beige, desert brown, silver, brown
Texture	Smooth valley floor	Mottled; medium to coarse vegetation	Smooth surfaces

3. Narrative:

A broad, enclosed landscape surrounded on most sides by dramatic mountain ranges. Vast, natural-appearing. Vegetation is somewhat visually dominant.

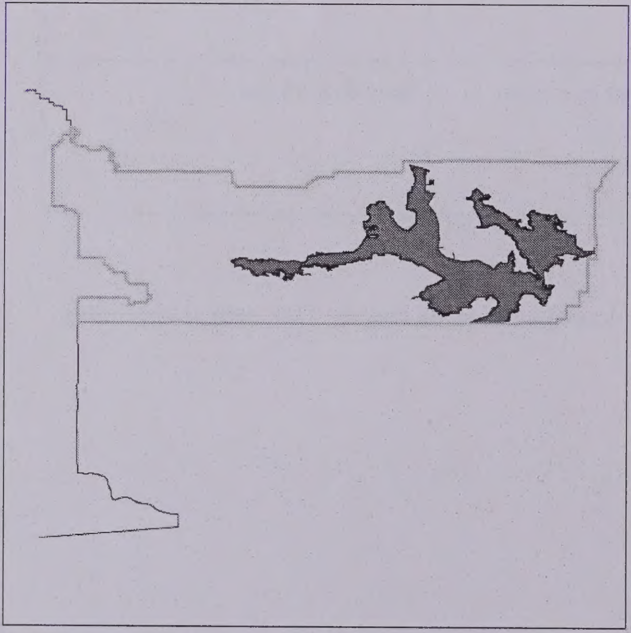
Scenic Quality Rating Unit: Chuckwalla Valley

4. SCORE

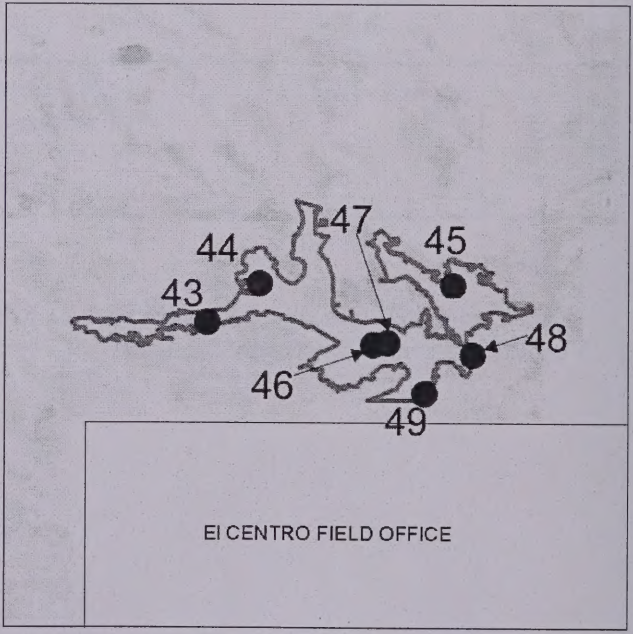
	Rating	EXPLANATION OR RATIONALE	SCENIC QUALITY CLASSIFICATION (check one)
a. Landform	1	Vast, low, gently rolling valley bottom	☐ A – 19 or more ☑ B – 12 – 18 ☐ C – 11 or less
b. Vegetation	3	Some variety of vegetation; one or two major types	
c. Water	0	None present	
d. Color	2	Subtle variation; some contrast in soil, vegetation	
e. Adjacent Scenery	4	Dramatic mountains surrounding area	
f. Scarcity	2	Fairly distinctive but not unusual	☐ Rehab
g. Cultural Modification	0	Some cultural modification but overall natural-appearing	☐ Special Area
TOTAL	12		

Comments:

The valley is a vast area, homogenous in terms of landform and vegetation with no line or break to suggest subdividing into smaller units. Adjacent scenery is dramatic from all IOPs.



SQRU Locator



• IOP Location

Appendix G.4

Visual Contrast Rating Data Sheets

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

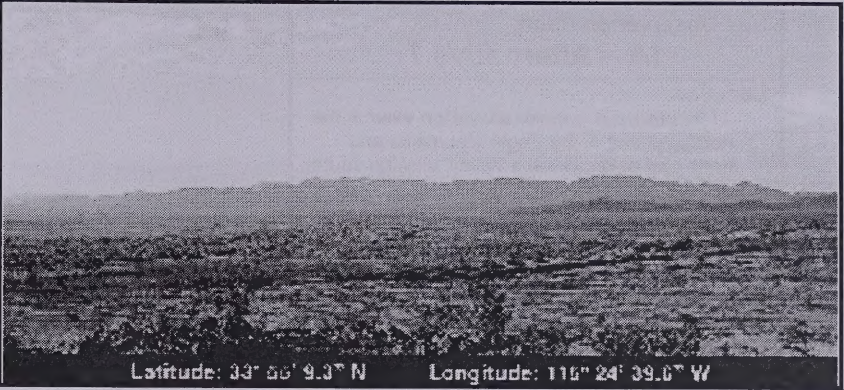
Key Observation Point
1 – Proposed Project

Location
JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class
IV

Analyst
Michael Clayton

Date
October 13, 2011


Latitude: 33° 50' 9.3" N Longitude: 115° 24' 39.0" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Barely noticeable horizontal demarcation as defined by graded areas	Horizontal to vertical though barely discernible
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4		
Color	4				4					4		
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☒ **Low** ☐ **Moderate** ☐ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

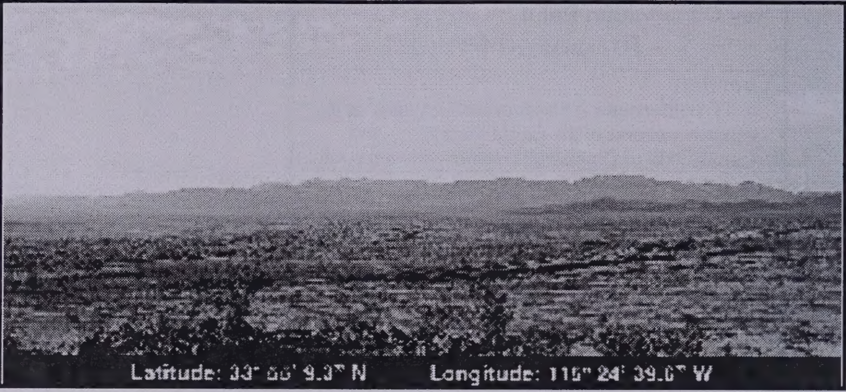
Key Observation Point
1A – Alternative 7

Location
JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class
IV

Analyst
Michael Clayton

Date
January 16, 2012



CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Slightly noticeable horizontal demarcation due to grading/structures	Horizontal solar field and barely discernible vertical transmission structures
Color	Same	Same	Light blue to light and dark grays depending on panel orientation and sun angle
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4	4	
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☒ **Low** ☐ **Moderate** ☐ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

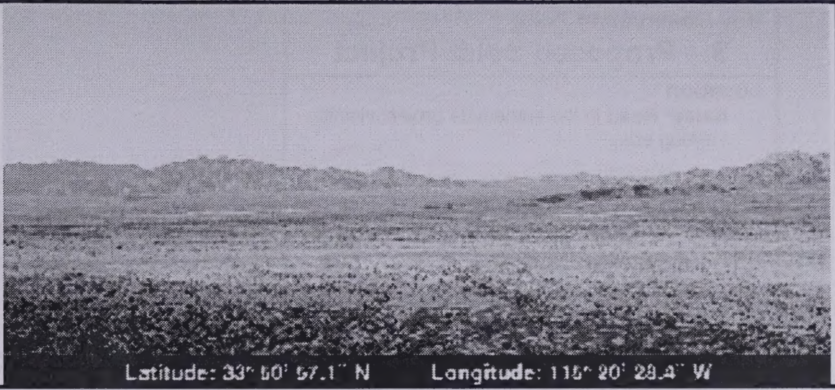
Key Observation Point
2 – Proposed Solar Project

Location
JT Wilderness – higher elevation view along the western flank of the Coxcomb Mountains, viewing southwest over Chuckwalla Valley.

VRM Class
IV

Analyst
Michael Clayton

Date
January 16, 2012



CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to angular and irregular mountain ranges	Fairly even distribution with some linear patchiness defined by drainage	None readily apparent
Line	Horizontal to irregular and diagonal	Curvilinear as defined by drainage to horizontal as defined by valley floor	None readily apparent
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	None readily apparent
Texture	Smooth to matte	Matte	None readily apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Prominent geometric patterns and faintly noticeable verticals
Line	Same	Prominent horizontal to diagonal demarcations as defined by graded	Prominent horizontal to diagonal with barely discernible verticals
Color	Tan to bluish hues at distance with lighter tans of disturbed soils	Same	Light to medium gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4				4	4
Color			4		4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

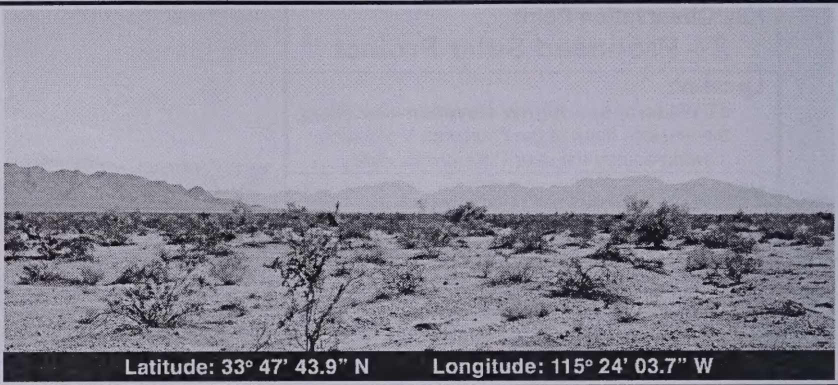
Key Observation Point
3 – Proposed Solar Project

Location
Kaiser Road in the immediate project vicinity, viewing east.

VRM Class
IV

Analyst
Michael Clayton

Date
October 26, 2011



Latitude: 33° 47' 43.9" N Longitude: 115° 24' 03.7" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Light to dark gray to bluish hue depending on angle of view and weather conditions.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	4
Color	4				4						4	
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

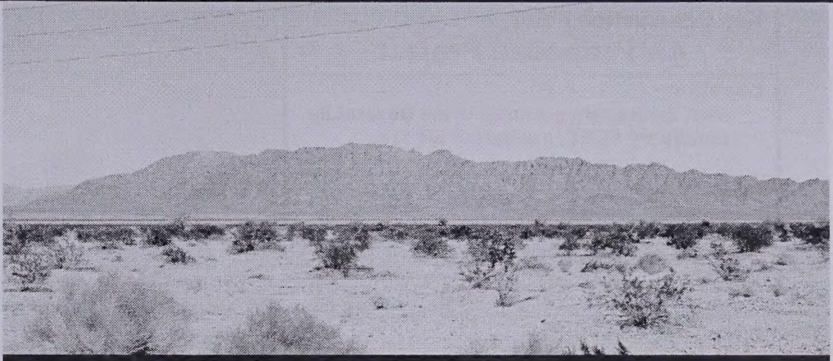
Key Observation Point
3A – Alternative 7

Location
Kaiser Road in the immediate project vicinity, viewing northeast.

VRM Class
IV

Analyst
Michael Clayton

Date
March 23, 2012



Latitude: 33° 47' 43.15" N **Longitude: 115° 24' 03.75" W**

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Tan, medium to dark gray to black, to bluish hue depending on panel orientation/weather
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4					4
Color	4				4						4	4
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☐ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

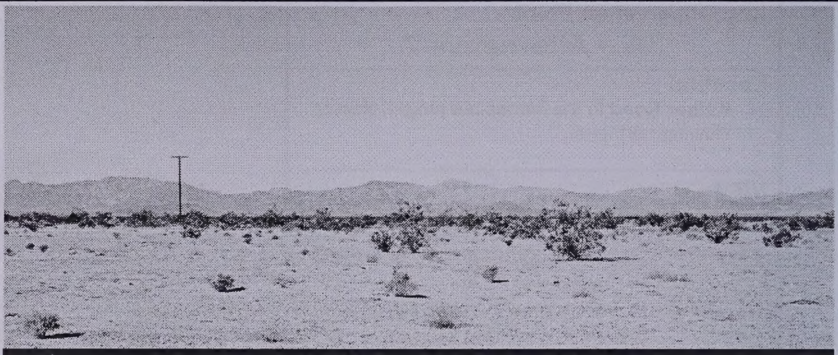
Key Observation Point
4 – Proposed Project

Location
Near the western perimeter of the **Desert Lily Sanctuary ACEC**, just east of SR 177.

VRM Class
IV

Analyst
Michael Clayton

Date
October 26, 2011



Latitude: 33° 47' 26.3" N Longitude: 115° 18' 21.4" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to horizontal and slightly rounded to irregular mountains	Patchy clumps to irregular and continuous at distance	Simple linear
Line	Horizontal to irregular and angular	Irregular and indistinct to horizontal as defined by valley floor	Vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Dark brown
Texture	Smooth to granular and coarse	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Indistinct simple linear of gen-tie transmission line
Line	Same	Same	Indistinct vertical
Color	Same	Same	Indistinct light gray
Texture	Same	Same	Indistinct smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4				4					4		
Color	4				4				4			
Texture	4				4				4			

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☒ Very Low ☐ Low ☐ Moderate ☐ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

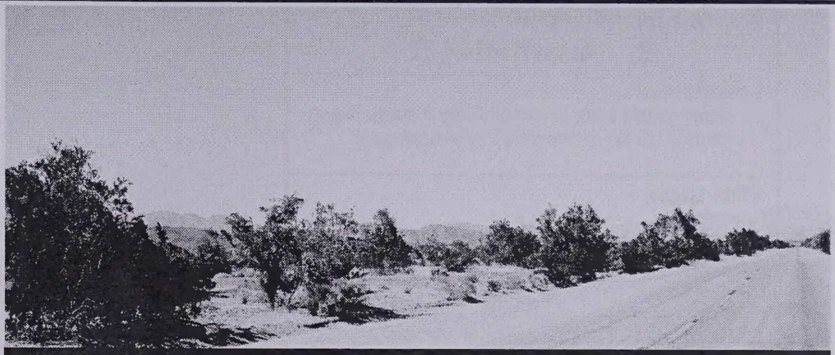
Key Observation Point
5 – Alternatives B and C

Location
Northbound Kaiser Road in the immediate vicinity of the Lake Tamarisk residential development.

VRM Class
IV

Analyst
Michael Clayton

Date
October 12, 2011



Latitude: 33° 44' 36.7" N Longitude: 115° 24' 02.3" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4				4							4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☐ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

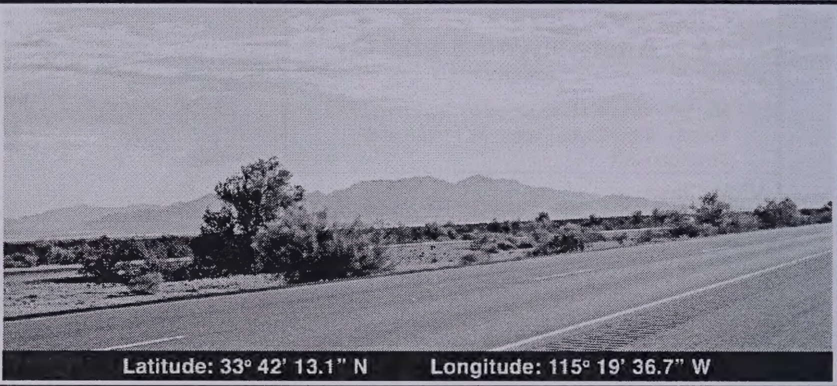
Key Observation Point
6 – Alternative D

Location
Eastbound I-10, approximately 0.8 mile west of the I-10 span, viewing to the northeast.

VRM Class
IV

Analyst
Michael Clayton

Date
October 26, 2011


Latitude: 33° 42' 13.1" N Longitude: 115° 19' 36.7" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to rugged angular background mountains	Patchy clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Prominent horizontal to diagonal lines of demarcation as defined by graded areas	Prominent vertical (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4					4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☐ Very Low ☐ Low ☐ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

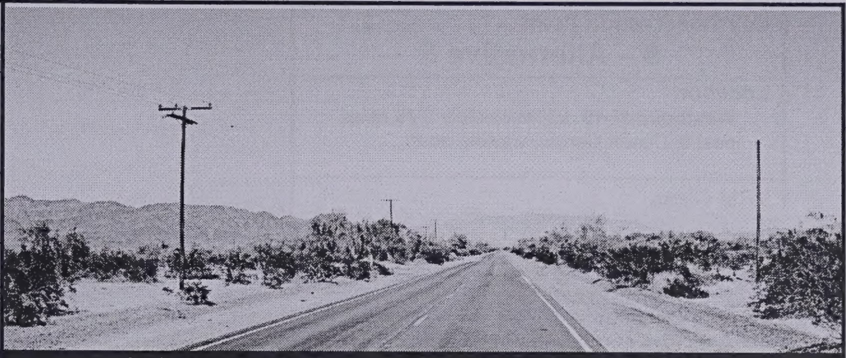
Key Observation Point
7 – Alternative E

Location
Northbound SR 177, approximately 0.3 mile southwest of the span, viewing to the northeast.

VRM Class
IV

Analyst
Michael Clayton

Date
October 12, 2011



Latitude: 33° 45' 58.5" N Longitude: 115° 20' 14.1" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road and utility poles
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal to vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light to medium gray (road), dark brown (poles)
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

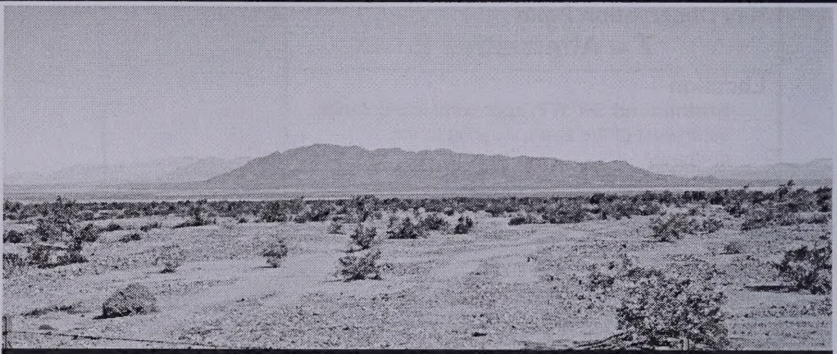
Key Observation Point
8 – Alternative E

Location
Westbound I-10, approximately 5.75 miles east of Desert Center, viewing north.

VRM Class
IV

Analyst
Michael Clayton

Date
October 13, 2011



Latitude: 33° 42' 1.65" N Longitude: 115° 18' 13.32" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) to less distinct curvilinear (conductors)
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

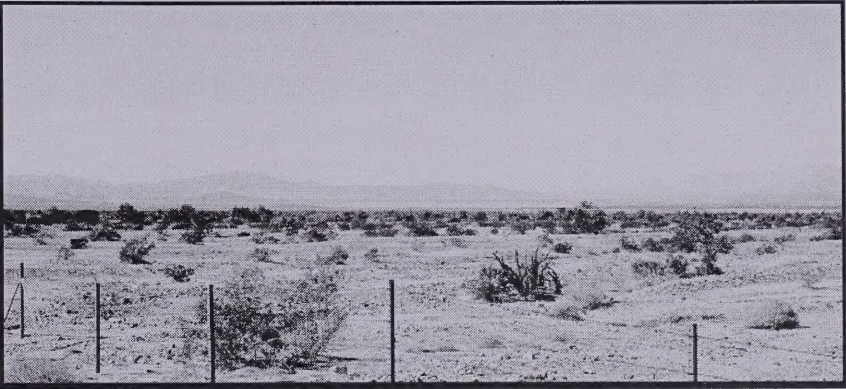
Key Observation Point
8A – Alternative 7

Location
Westbound I-10, approximately 5.75 miles east of Desert Center, viewing northwest.

VRM Class
IV

Analyst
Michael Clayton

Date
March 23, 2012



CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) and noticeable horizontal (solar field)
Color	Same	Same	Light to dark grays to bluish hew (solar arrays) depending on view angle/weather.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Appendix G.5

Time-Lapse Visual Simulations

Desert Harvest Solar Project

Final Environmental Impact Statement and Proposed California Desert Conservation Area Plan Amendment

(DOI-BLM-CA-D000-2012-0004-EIS)

Appendix G5:

Time Lapse Simulations from KOP 2 and KOP 9

BLM

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